

and macrobenthos characterization studies were also carried out in during dredging in Phase 2, but over the entire river length (in both dredged and undredged zones) on which dredging was implemented.

Following completion of dredging in the fall of 2010, post-dredging (Phase 3) sampling of the sediment residual profile at full depth was immediately performed before the onset of winter. Sediment core samples were taken at the same 30 locations used for pre-dredging sediment core collection in Phase 1. Utilizing the same coring locations is facilitating direct comparison of undisturbed sediment depth and contaminant profiles before dredging with residual sediment depth and contaminant profiles following implementation of the remedy

RATIONALE FOR THIS PROJECT

Completion of immediate post-dredging characterization studies and initiation of additional source tracking efforts south of the 2010 dredge zone (i.e., south of RM 8.8) in the Ottawa River are planned for the summer of 2011 under WA 2-10 to fulfill both ORD and GLNPO objectives. ORD desires to complete its initial assessment of remedy effectiveness for the dredged portion of the Ottawa River, and GLNPO has determined that additional testing is necessary south of RM 8.8 to identify possible contamination zones that were not considered in the 2010 dredge plan.

The 30 post-dredging cores from Phase 3 were subdivided into 378 sediment segment samples for PCB, PAH, total organic carbon (TOC), moisture content, and particle size distribution (PSD) analysis. All 378 TOC, moisture content, and PSD analyses will be completed under WA 1-11 prior to June 22, 2011. However, PCB and PAH analyses will be completed on only 152 of the samples by that date. PCB and PAH analyses for the remaining 226 segment samples will be deferred to and completed on WA 2-10 beginning on June 23, 2011. Completion of Phase 3 post-dredging characterization studies including collection and analysis of fish tissue, macrobenthos tissue, food web tissue, and organic matter as well as deployment, retrieval, and analysis of passive surrogate samples will also be carried out on WA 2-10 after June 23, 2011 to complete immediate post-dredging characterization studies.

As part of the GLLA remediation project currently underway on the Ottawa River, an ongoing source identification effort is underway. Recently-identified depositional areas near RM 8.8, labeled DMUs 4X and 4Y, have raised concerns relative to potential for previously unidentified PCB contamination that may exceed cleanup goals and impact the river and the remediation efforts currently being conducted. Preliminary sediment sampling has been conducted by GLNPO over several transects south, or upriver, of the 2010 dredge zone covering approximately RM 9 to RM 11 in Reach 5. Results indicated low levels of PCBs not consistent with the elevated levels found in DMUs 4X and 4Y at RM 8.8.

Further investigation is necessary to expand the contaminant data base in this area of the river and determine if consideration of further southward environmental dredging may be necessary. The off-the-shelf investigative tools selected include the use of an industry-accepted passive surrogate sampling technology (semi-permeable membrane devices [SPMDs]), biological (bivalves) and food web (spider) tissue collection and analysis, and sediment traps to collect and analyze newly-deposited sediment. Use of both water column (SPMDs and bivalves) and

sediment (sediment traps) deployments in conjunction with one another will permit determination of water soluble contaminants (SPMDs), water soluble/water particulate-associated contaminants (bivalves), and sediment-associated contaminants (sediment traps). Collection and examination of spiders along the river banks will further elucidate the nature of the ecosystem in this area of the river. For all source tracking samples, PCBs will be quantified at the congener-specific level to allow source fingerprinting and comparison to sediment samples already analyzed in DMUs 4X and 4Y.

OBJECTIVES

The objectives of this project are two-fold:

1. Complete a comprehensive set of physical, chemical, and biological measurements in the post-dredging characterization phase (Phase 3) of this project for comparison with pre-dredging (Phase 1) and during-dredging (Phase 2) characterization studies to facilitate an assessment of immediate remedy effectiveness. (Note: Future out-year studies may be conducted to enable long-term assessment of remedy effectiveness. This project is concerned only with evaluation of immediate results in assessing the efficacy of this sediment remediation technology.)
2. Conduct a tracking study to elucidate the potential presence of additional, previously undetected sources of high-level PCB sediment contamination in the 2-mile length of Reach 5 of the Ottawa River immediately upriver (south) of the 2010 dredge zone.

DESCRIPTION OF TASKS

The above objectives of this project will be addressed and carried out on WA 2-10 during Option Period 2 of Contract No. EP-W-09-024 during the period of June 23, 2011 - June 22, 2012. Because these two objectives are essentially mutually exclusive and independent of each other, the tasks necessary to their successful implementation will be separated into two parts below (Parts A and B - Remedy Effectiveness Study and Source Tracking Study, respectively) under this **Description of Tasks** heading. The Contractor shall prepare Part A and Part B Technical and Financial Work Plans such that the two areas of work can be reviewed, pursued, accounted, and billed independently and separately. In addition, the Contractor shall prepare an integrated summary table that combines the costs of the two Financial Work Plans and facilitates review and assessment of the total cost requirements for this project. The tasks detailed below provide a description of work and reporting elements deemed necessary to carry out this project.

Part A. Remedy Effectiveness Study

Task A-1. Development of Technical and Financial Work Plans

The Contractor shall develop a synoptic Technical Work Plan and a detailed Financial Work Plan for carrying out Part A of WA 2-10. Most of the tasks involved in Part A of this work assignment were conducted in similar fashion under WAs 0-11 and 1-11. The Technical Work Plan for Part A can mimic, where appropriate, most of the features of Ottawa River WA 0-11

and WA 1-11 Work Plans. The Financial Work Plan for Part A shall present cost breakdowns for each individual task. The Contractor shall prepare Part A draft Work Plans for ORD/GLNPO within 2 weeks of receiving the Notice to Proceed. ORD/GLNPO will review, request changes as needed, and approve within 1 additional week.

Note 1 to Contractor: No events transpired during WA 1-11 necessitating the preparation of a new Quality Assurance Project Plan (QAPP) or an Addendum to the QAPP prepared for WA 1-11 (QAID 163-Q17) to address Part A of this work assignment. All elements of Part A work are adequately covered under QAID 163-Q17, and this QAPP can, therefore, be utilized by reference to fulfill quality assurance (QA) requirements of Part A work.

Note 2 to Contractor: The Health and Safety Plan (HASP) prepared by the Contractor for WA 1-11 has been approved by the U.S. EPA NRMRL Health and Safety Officer for continuing use on the Ottawa River project through 2014. Therefore, no supplements or modifications to the existing HASP are required for Part A or Part B of this work assignment.

Task A-2. Provision of Support for Real Time Monitoring Activities

As in WA 1-11, the Contractor shall provide logistical support for deployment, relocation as needed, and retrieval of ORD's real time monitors including installation of buoys and other attachment devices, installation and securing of instrumentation, calibration and adjustment of instruments and recorders as needed, and retrieval of same. ORD also anticipates needing general field support from the Contractor for other various and sundry tasks such as instrumentation maintenance, repair of damaged sampling stations and equipment, relocation of sampling equipment due to natural events in the river, etc. For estimating purposes, ORD anticipates needing approximately 85-90 hr of Contractor logistical support service from June 23, 2011 through June 22, 2012.

Task A-3. Receipt and Analysis of Fish Tissue Samples

ORD intends to collect 18 composites of small, short-lived adult fish (three composites of emerald shiners and three composites of fathead minnows for each of Reaches 2, 3, and 4) and 30 brown bullhead fish (30 for each of Reaches 2, 3, and 4) for analysis by the Contractor during the week of July 18, 2011. Following necropsy and sample freezing, ORD will send to the Contractor 48 frozen fish tissue samples for analysis. The Contractor shall homogenize the samples independently and conduct the following suite of analyses on each of the 48 fish tissue samples provided by ORD using methods approved in QAID 163-Q14 developed for WA 0-1 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11:

- | | |
|--|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. Wet Weight |
| 3. PCB Aroclors (10% of samples = 5 samples) | 6. Lipids |

All fish tissue analyses shall be completed by October 31, 2010.

All fish tissue samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task A-4. Receipt and Analysis of Food Web Tissue Samples

ORD intends to collect food web tissue samples during the summer sampling period for this project (fish in mid-July 2011 [coincident with the fish catch in Task A-3 above] and invertebrates [primarily spiders] in mid-August 2011). During this period, it is anticipated that a total of 150 food web tissue samples will be collected for analysis by the Contractor. Following the mid-August sampling, ORD will freeze and send the anticipated number of 150 food web tissue samples to the Contractor for analysis. The Contractor shall homogenize the samples independently and conduct the following suite of analyses on each of the 150 anticipated food web tissue samples provided by ORD using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11. (Note: PAH analyses shall not be conducted on food web tissue samples):

- | | |
|---|---------------|
| 1. PCB Individual Congeners | 4. Wet Weight |
| 2. PCB Homologs | 5. Lipids |
| 3. PCB Aroclors (10% of samples = 15 samples) | |

All food web tissue analyses shall be completed by November 30, 2011.

All food web tissue samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task A-5. Receipt and Analysis of Food Web Organic Matter Samples

ORD again intends to collect food web organic matter samples in mid-August 2011. During this period, it is anticipated that a total of 15 food web tissue samples will be collected for analysis by the Contractor. Following the mid-August sampling, ORD will freeze and send the anticipated 15 food web organic matter samples to the Contractor for analysis. The Contractor shall homogenize the samples independently and conduct the following suite of analyses on each of the 15 anticipated food web organic matter samples provided by ORD using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11. (Note: PAH analyses shall not be conducted on food web organic matter samples):

- | | |
|--|---------------|
| 1. PCB Individual Congeners | 4. Wet Weight |
| 2. PCB Homologs | 5. Lipids |
| 3. PCB Aroclors (10% of samples = 2 samples) | |

All food web tissue analyses shall be completed by November 30, 2011.

All food web tissue samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task A-6. Analysis of Post-Dredging Sediment Core Segments Deferred from WA 1-11 (Option Period 1)

A total of 378 segments of 6-in. length or less were formed from the 30 sediment cores collected on WA 0-11 during Phase 1 (pre-dredging characterization) and the 30 additional cores collected on WA 1-11 during Phase 3 (immediate post-dredging characterization). Via recent notification from the Contractor, all analytical requirements will have been completed on only 152 of these core segments by the end of WA 1-11 on June 22, 2011. The uncompleted analyses on the remaining 226 core segments shall be deferred until Option Period 2 and conducted on WA 2-10 beginning on June 23, 2012. TOC, moisture content, and PSD analyses will have been finished on all 378 core sediment segments by the end of WA 1-11. Only PCB and PAH analyses remain to be completed on the aforementioned 226 core segments. Accordingly, the Contractor shall conduct the following suite of analyses on each of the 226 deferred core sediment segment samples collected previously on WAs 0-11 and 1-11 using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11. (Note: No PCB Aroclors are to be conducted on these samples):

1. PCB Individual Congeners
2. PCB Homologs
3. PAHs (16 priority plus alkylated)

All sediment core segments analyses shall be completed by September 31, 2011.

All composite surface sediment samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Following completion of these core segment analyses, the Contractor shall import the results of this exercise into the database of the data summary report prepared for WA 1-11 in Option Period 1.

Task A-7. Deployment and Retrieval of Sampling Devices

The Contractor shall deploy body burden (BB) and ECO Hester-Dendys (H-Ds) and SPMD passive samplers at the 18 stations whose coordinates are identified in Table A-1. These samplers shall be deployed using highly accurate GPS equipment (capable of matching specified coordinates in the x-y [horizontal] plane within ± 10 cm and in the z [vertical] plane within ± 5 cm). The sampler bundle arrangement shown in Figure 3 shall be utilized by the Contractor for the deployments. At all 18 stations, six in each of Reaches 2, 3, and 4, duplicate BB H-D cage samplers equipped with standard 3-in. x 3-in substrate plates shall be suspended in the water column in two rectangular plots or layouts (20 H-D assemblies per plot or cage, 40 per station) on either side of the depicted passive samplers. ORD will provide all necessary BB H-D cages

and SPMD cages and racks. Between the two identical BB H-D cage layouts (20 H-D assemblies in each cage or layout), an SPMD cage shall also be suspended in the water column at each station as shown, yielding a total deployment of 18 SPMD cages. A sediment SPMD rack shall be installed directly below and attached by cable to the water column SPMD at each station, yielding a total deployment of 18 SPMD racks. The SPMD racks shall be installed in contact with the sediment surface. At six of the above sampling stations, an ECO H-D cinder block sampler shall also be installed alongside the SPMD deployments as indicated in Figure A-3 and prescribed in the ORD-NERL attachment to QAID 163-Q14 developed for WA 0-11 for Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11. The ECO H-Ds will be provided by ORD. The Contractor shall provide the cinder blocks. The ECO H-D cinder block samplers shall be laid on their sides on the sediment surface (with the H-Ds positioned on the upper sides of the cinder blocks). All SPMD materials, including standard SPMD ribbons, canisters for holding the water column SPMDs intact, trip blank SPMDs, and reference compound spikes, shall be purchased or rented from Environmental Sampling Technologies (EST), St. Joseph, MO.

The bundle of sampling devices described above shall be installed as close to each as practical to minimize spatial variations in sample character and integrity. All H-D and SPMD devices shall be installed during the first 2-3 days of the week of August 14, 2011 (coincident with the collection of food web tissue and organic matter samples) at a rate at which on-site ORD researchers can harvest macroinvertebrate growth from the BB H-Ds during retrieval [and preserve the ECO H-Ds for later enumeration and identification by ORD (NERL)-Cincinnati].

All SPMD samplers shall be retrieved during the week of September 11, 2011 on a schedule that provides for 28-day exposure for each device. The H-D samplers shall be retrieved during the week of September 25, 2011 on a schedule that provides for 42-day exposure of each sampler.

Upon retrieval, all SPMD ribbons shall be removed from sediment racks and the water column cages, properly packaged and iced, and sent to EST for dialysis and extraction. The extracts will be returned to the Contractor for clean-up and analysis.

Upon retrieval, the BB H-D macrobenthos samples will be harvested on site by ORD personnel who will bottle the harvested macroinvertebrate growth in jars provided by the Contractor and transfer custody of them to the Contractor for subsequent analysis. The harvested macroinvertebrate growth for all 20 BB H-D cages for each individual plot or layout at any given station shall be combined to yield one composite sample per plot or two composites for the duplicate plots at each station, yielding a total of 36 BB H-D macroinvertebrate samples. Upon retrieval, the ECO H-Ds shall be turned over to ORD for Agency analysis. At the time of H-D retrieval, ORD researchers will collect qualitative dip net samples in the vicinity of the six ECO H-D sample locations. These qualitative samples will be used in conjunction with data derived from the macroinvertebrates colonizing the ECO H-Ds to develop Ohio EPA macroinvertebrate metrics and Lacustrine Index of Biotic Integrity scores.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with H-D and SPMD deployment and H-D retrieval and other tasks as needed. This staff member will not be available for SPMD retrieval.

Task A-8. Conduct of Macroinvertebrate and SPMD Analyses

The Contractor shall conduct the following suite of analyses on each of the 36 BB macroinvertebrate samples harvested in Task A-7 above using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11:

- | | |
|--|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. Wet Weight |
| 3. PCB Aroclors (10% of samples = 4 samples) | 6. Lipids |

All macroinvertebrate analyses shall be completed by December 31, 2011.

All macroinvertebrate samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

The Contractor shall conduct the following suite of analyses on the 36 SPMD extracts returned to the Contractor by EST in Task A-7 above using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11:

- | | |
|------------------------------------|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. PCB Aroclors (10% of samples = |
| 3. Performance Reference Compounds | 2 Sediment SPMDs and |
| | 2 water column SPMDs) |

All SPMD analyses shall be completed by December 31, 2011.

All SPMD samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task A-9. Collection of Surface Sediment and Water Column Samples

The Contractor shall collect a composite surface sediment sample at each of the 18 stations where H-D assemblies and SPMD were deployed in Task A-7 (coordinates summarized in Table A-1). These samples shall be collected during the week of August 14, 2011 coincident with the deployment of the H-D assemblies and SPMDs and again during the week of September 25, 2011 coincident with the retrieval of the H-D assemblies, yielding a total of 36 composite surface sediment samples requiring analysis. Each surface sediment sample shall be formed by compositing the top 6 in. of 16 grab push cores taken uniformly spaced around the targeted sampling station. The Contractor shall provide a GPS system to position its push core sampler over each desired sample location. This GPS system shall be capable of matching specified coordinates in the x-y (horizontal) plane within ± 10 cm and in the z (vertical) plane within ± 5

cm. Using this GPS equipment, the Contractor at each station shall duplicate as closely as possible the same perimeter sampling pattern utilized in WA 0-11 for Phase 1 surface sediment push core sampling.

During each of the above two surface sediment sampling events, the individual cores shall be composited on site to yield a total of 18 composite surface sediment samples. Standard sediment cores shall be employed that yield approximately 0.5 L of wet sediment sample in a 6-in. length. The 16 grab cores should, therefore, yield approximately 8 L of homogenized composite sample volume per station. Approximately 2 L of this volume shall be properly packaged and sent to ORD (NERL)-Cincinnati for sed-tox testing. Another 1-1.5 L, as needed, shall be reserved by the Contractor for sediment chemistry analyses. The remainder shall be properly packaged and sent to ORD (NRMRL)-Cincinnati for a battery of additional tests.

The Contractor shall collect grab water column samples in tandem with sediment sample collection at each of the above 18 stations during the week of August 14, 2011. These water samples shall be collected at approximate mid-depth of the water column. Sufficient sample shall be collected to conduct the battery of water chemistry analyses specified in Task A-10 below. The samples shall be properly packaged and sent to the Contractor's laboratory for analysis. No water column samples shall be collected during either sampler retrieval event.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with surface sediment and water column sampling at both sampling events during the weeks of August 14 and September 25, 2011.

Task A-10. Conduct of Surface Sediment and Water Column Analyses

The Contractor shall conduct the following suite of analyses on each of the 36 composite surface sediment samples collected in Task A-9 above using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11:

- | | |
|--|---------------------|
| 1. PCB Individual Congeners | 5. TOC |
| 2. PCB Homologs | 6. Moisture Content |
| 3. PCB Aroclors (10% of samples = 4 samples) | 7. PSD |
| 4. PAHs (16 priority plus alkylated) | |

All composite surface sediment analyses shall be completed by December 31, 2011.

All composite surface sediment samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

The Contractor shall conduct the following suite of analyses on the 18 grab water column samples collected in Task A-9 above using methods approved in QAID 163-Q14 developed for WA 0-11 in Phase 1 and attached to updated QAID 163-Q17 used for Phases 2 and 3 in WA 1-11:

- | | |
|--|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. TOC |
| 3. PCB Aroclors (10% of samples = 2 samples) | 6. TSS |

All grab water column analyses shall be completed by December 31, 2011.

All grab water column samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task A-11. Preparation of Monthly Progress Reports

Brief monthly progress reports shall be submitted to ORD/GLNP) by the 20th of the month following the first full month work assignment initiation. These reports shall summarize technical progress and any problems encountered, resolution of said problems, the latest data results, and cost expenditures.

Task A-12. Preparation of Comprehensive, Interpretive Final Report

The Contractor shall prepare a comprehensive, interpretive report of all data, measurements, observations, and findings generated in the three phases of this project WAs 0-11, 1-11, and 2-10). The report shall integrate the conclusions reached into a holistic presentation and summary of results.

The report shall elaborate the strategy used throughout the three phases to achieve overall project goals. Post-dredging residual sediment data samples shall be compared to pre-dredging characterization data to determine sediment removal efficiency and the relationship between beginning and ending sediment mass inventories and concentration profiles. The report shall focus on linking the various types of measurements taken and data generated to project objectives with the ultimate goal of developing a holistic interpretive analysis of the impact of environmental dredging on sediment removal efficacy and ecosystem recovery. Single or standalone lines-of-evidence for each matrix shall be linked via interpretation of results between matrix species to develop a weight of -evidence approach. The report shall specify and demonstrate the statistical methods and procedures used to interpret and analyze data results in support of project goals.

Assuming that all analytical requirements are completed by December 31, 2011, the draft final report shall be submitted to ORD/GLNPO by March 31, 2012. ORD/GLNPO will review the draft report, request changes as needed, and return the draft report for corrections to the Contractor by April 30, 2011. The Contractor shall submit the corrected final interpretive report to ORD/GLNPO for review and approval by May 31, 2011. An anticipated additional 22 days will remain at that time to handle any remaining problems and issues, if any, with the report before termination of WA 2-10 (Option Period 2) on June 22, 201

Part B. Source Tracking Study

Task B-1. Development of Technical and Financial Work Plans

The Contractor shall develop a synoptic Technical Work Plan and a detailed Financial Work Plan for carrying out Part B of WA 2-10. Some of the tasks involved in Part B of this work assignment were conducted in similar or related fashion under WAs 0-11 and 1-11. The Technical Work Plan for Part B can use appropriate segments of the WA 0-11 and WA 1-11 Work Plans. The Financial Work Plan for Part B shall present cost breakdowns for each individual task. The Contractor shall prepare Part B draft Work Plans for ORD/GLNPO within 2 weeks of receiving the work assignment. ORD/GLNPO will review, request changes as needed, and approve within 1 additional week.

Task B-2. Preparation of New QAPP

Although some of the elements of the previous QAPPs for the remedy effectiveness portion (Part A) of this work assignment, particularly analytical methods and QA checks, are relevant to the Part B scope, there are sufficient differences in the nature of the work to be accomplished to merit preparation of a new QAPP for Part P of this project. The Contractor shall prepare a new QAPP that specifically addresses the QA requirements of the new features of this work scope, namely deployment of bivalves, sediment traps, and 6-in. SPMDs in disposable stainless steel cassettes. Pertinent sections of the Part A QAPPs that duplicate QA methodology and requirements for this source tracking effort can be inserted into this QAPP where appropriate.

The Contractor shall prepare a draft Part B QAPP for ORD/GLNPO review within 2 weeks of receiving the Notice to Proceed. ORD/GLNPO will review the draft QAPP, request changes as needed, and approve within 2 additional weeks.

Note to Contractor: As indicated previously on page 6 under Task A-1, the HASP prepared by the Contractor for WA 1-11 has been approved by the U.S. EPA NRMRL Health and Safety Officer for continuing use on the Ottawa River project through 2014. The scope and elements of this HASP are applicable to the work proposed for Part B of this project in all respects, thereby obviating the need to prepare a new HASP or update the current HASP.

Task B-3. Receipt and Analysis of Food Web Tissue Samples

ORD intends to collect food web tissue samples (primarily spiders) during mid-August coincident with deployment of the selected samplers. The spiders will be collected along both banks of Reach 5 to assist in defining the natural habitat of this area and the impact, if any, of potential sources of contamination on these species. During this period, it is anticipated that a total of 20 composite food web tissue samples will be collected for analysis by the Contractor. Following the mid-August sampling, ORD will freeze and send the anticipated number of 20 composite food web tissue samples to the Contractor for analysis. The Contractor shall homogenize the samples independently and conduct the following suite of analyses on each of the 20 anticipated food web tissue samples provided by ORD using methods approved in the new QAPP for Part B:

- | | |
|--|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. Wet Weight |
| 3. PCB Aroclors (20% of samples = 4 samples) | 6. Lipids |

All food web tissue analyses shall be completed by October 31, 2011.

All food web tissue samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task B-4. Deployment of Sampling Devices

The Contractor shall deploy 42 SPMD samplers suspended in the water column, 39 bivalve (most likely Asian clams) samplers also suspended in the water column, and 39 sediment traps embedded in or laying on the surface of the sediment. These samplers shall be deployed in sets of three at each of 13 transects in Reach stretching 5,200 ft southward from DMUs 4X and 4Y to the Upton Street bridge. A duplicate set of SPMD samplers shall be deployed at one of the 13 transects to be determined on site. Eight of the transects will be located on 200-ft intervals in the 1,600-ft distance between the I-75 bridge crossing and the Auburn Road bridge (see Figure B-1). Four more will be located further upriver (southward) on 800-ft intervals (Figure B-1) in the 3,600-ft stretch between the Auburn Road bridge and the Upton Street bridge. A 13th transect will be located near a yet-to-be-determined combined sewer overflow (CSO) or other storm water outfall discharging into this area of the Ottawa River. Exact placement of the 13 transects will be determined on site in concert with ORD/GLNPO staff just prior to sampler deployments.

The Contractor shall deploy the samplers in three sets across each transect (Figure B-2) at the approximate one-half and one-third points of the river width. The bivalve cages and the SPMD cassettes shall be chained together before (in the direction of flow) the stationary sediment traps. In the reach between I-75 bridge and the Auburn Road bridge, the river is shallow and can be waded. In this area, the eight transects of bivalve cages and SPMD canisters will need to be anchored (staked) to the riverbed to prevent unwanted movement. In shallow water, the sediment traps shall be embedded in the top sediment layer such that the top of the sediment trap tray is even with the level of the surface sediment. The river is much deeper upriver and not capable of being waded between the Auburn Road bridge and the Upton Street bridge. In this stretch, a boat(s) will be needed to deploy the samplers. The bivalve and SPMD samplers most likely will need to be tethered to floatable buoys in this area to retain desired positioning. Also, rather than being physically embedded in the sediment layer as in the shallow areas, the sediment traps will have to be lowered to and laid on the sediment bed in these deeper water sites. Any embedding or sinking into the sediment layer will need to be promoted by their own weight. These deeper water traps will need to be marked in some fashion to locate them and equipped with a means of retrieving them without spilling the accumulated sediment.

The SPMDs, bivalves, and sediment traps shall be deployed together during the week of August 14, 2011. A total deployment or installation time of 4-5 days is anticipated. The samplers shall be left in the Ottawa River source tracking zone for a 6-wk exposure.

Using this array of samplers will enable determination of water soluble contaminants (SPMDs), water soluble/particulate-associated contaminants (bivalves), and sediment-associated contaminants (sediment traps). For all three sampler types, PCBs shall be quantified at the congener-specific level to allow source fingerprinting and comparison to sediment sample analyses already available from DMUs 4X and 4Y. Including the collection and analysis of indigenous food web species (spiders) in this sampling program (see Task B-3) incorporates the potential impact undetected contaminant sources may be having on the local ecosystem.

No indigenous bivalves are available for this river system in quantity to allow deployment of native species. However, Asian clams, though not native to the system, are widespread throughout the United States and have been found in this study area. A natural supply of Asian clams has not been identified, but commercial suppliers are available. The Contractor shall be responsible for locating and procuring suitable Asian clams and acquiring necessary State and/or local approval and authorization for their deployment in this program. The Contractor shall make arrangements to receive the clams 24-48 hr before they will be deployed. Clams shall, be sorted by size, and only large clams (25-35 mm measured along the long axis) shall be used in this study. Upon receipt, the clams shall be transferred to buckets containing fresh water from the river to maintain their survival. Asian clams shall be deployed at each transect in three submersible metal baskets (minnow traps) 16 in. long and 9 in. wide constructed of ¼-in. (6.4-mm) square galvanized wire mesh. ORD will provide sufficient minnow traps for all clam deployments. Each basket or minnow trap shall be filled with 20 clams. Composites of 10 clams from each basket shall be used for PCB analysis. The additional clams deployed in each basket provide extra tissue in case of potential clam mortality and deployment loss and for archive retention. Each composite or replicate of 10 clams shall be sealed in an aluminum foil pouch. The three foil pouches from each transect shall be labeled with the replicate number and placed in a single resealable labeled plastic bag.

SPMD samples shall consist of two 6-in. SPMD ribbons contained in a disposable stainless steel case or cassette provided by EST. The two SPMD ribbons in each case shall be composited to form a single replicate upon collection. Three replicates shall be collected at each transect. The SPMDs shall be stored in resealable metal cans, kept frozen prior to deployment, and transported to sampling sites on ice. The SPMDs cassettes shall be deployed immediately upon opening the storage cans. Collected SPMD cassettes shall be placed back in the cans and the cans labeled and returned to EST for processing.

The uptake rates of PCBs in SPMDs can be affected by environmental conditions such as biofouling and turbulence. To account for this potential source of variation, the SPMDs shall be spiked with PCB 14 and PCB 50 to serve as performance reference compounds (PRCs). These PRCs shall be used to aid in the estimate of *in-situ* SPMD uptake or sampling rates.

Sediment traps shall be deployed in conjunction with water column samplers at each transect. Bedload-type pit traps consisting of stainless steel trays of approximate size 12 in. x 8 in. x 6 in. shall be used for this study. These trays are designed, where possible, to be embedded in the top sediment layer and trap bedload and settling sediment as it passes over the tray. As indicated above, it will be more difficult to embed trays in the sediment in the deeper water between the Auburn Road bridge and the Upton Street bridge.

The above tray size is provided only as a guide to the Contractor in designing the trap systems. The Contractor has free latitude to alter the size to provide the optimum design for this river setting. The Contractor shall incorporate in the design a baffling assembly to prevent premature release of the newly deposited sediment back into the river, particularly during storms or other high flow events

A subset of clams and SPMDs shall be maintained in the field throughout the deployment process. Three replicates of 10 clams and three replicate SPMDs shall be submitted for baseline analyses of PCBs. Cans holding the field blanks shall be opened in the field and subsequently resealed, stored, and transported with the field samples. The SPMD field blanks shall be sent to EST along with the SPMD field-exposed samples where they will be processed via dialysis and extraction. The field blank extracts will be returned to the Contractor by EST for clean-up and analysis.

Task B-5. Retrieval of Sampling Devices

The Contractor shall collectively remove and retrieve the SPMD, bivalve, and sediment trap samplers from the source tracking sampling zone in the Ottawa River during the week of September 25, 2011 after a 6-wk exposure. Samples from each of the three stations for each transect shall be collected and containerized separately for transport to the respective analytical laboratories. Accordingly, a total of 42 SPMD samples, 39 clam samples, and 39 sediment samples shall be retrieved. At the Contractor's laboratory, each of the 39 clam samples and 39 sediment samples shall be homogenized separately. For the SPMDs, EST shall subject each of the 42 composites containing two ribbons each to separate dialysis and extraction. EST shall then return the 42 separate extracts to the Contractor.

For chemical analysis, the Contractor shall combine aliquots of the three extracts for the SPMDs, the three homogenized tissue samples for clams, and the three homogenized sediment samples for each transect into one larger aliquot for analysis. This procedure will result in a total of 14 SPMD composite extracts (plus three field blanks), 13 composite clam tissue samples (plus three field blanks), and 13 composite sediment samples for analysis. The remainder of each separately homogenized sample shall then be archived, such that an individual sample from one of the stations for a given transect could be retrieved and analyzed individually if a high contaminant concentration (hot spot) or other abnormality were found in the combined aliquot for that transect. In this manner, the portion of the transect with the high concentration could possibly be isolated.

Task B-6. Conduct of SPMD Analyses

Following receipt of the SPMD extracts from EST, the Contractor shall conduct the following suite of analyses on each of the 14 composite SPMD field sample extracts and three SPMD field blank extracts formed per Task B-5 above using methods approved in the new QAPP for Part B:

1. PCB Individual Congeners
2. PCB Homologs
4. PAHs (16 priority plus alkylated)
5. PCB Aroclors (20% of samples =

3. Performance Reference Compounds

3 samples)

All SPMD analyses shall be completed by November 30, 2011.

All SPMD samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task B-7. Conduct of Bivalve Clam Analyses

The Contractor shall conduct the following suite of analyses on each of the 13 composite field-exposed clam samples and three field blank clam samples formed per Task B-5 above using methods approved in the new QAPP for Part B:

- | | |
|--|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. Wet Weight |
| 3. PCB Aroclors (20% of samples = 3 samples) | 6. Lipids |

All clam analyses shall be completed by November 30, 2011.

All clam samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task B-8. Conduct of Sediment Analyses on Sediment Trap Sediment

The Contractor shall conduct the following suite of analyses on each of the 13 composite sediment samples formed per Task B-5 above using methods approved in the new QAPP for Part B:

- | | |
|--|---------------------|
| 1. PCB Individual Congeners | 5. TOC |
| 2. PCB Homologs | 6. Moisture Content |
| 3. PCB Aroclors (20% of samples = 3 samples) | 7. PSD |
| 4. PAHs (16 priority plus alkylated) | |

All sediment analyses shall be completed by November 30, 2011.

All sediment samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples will then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task B-9. Preparation of Monthly Progress Reports

Brief monthly progress reports shall be submitted to ORD/GLNP) by the 20th of the month following the first full month after the Notice to Proceed. These reports shall summarize

technical progress and any problems encountered, resolution of said problems, the latest data results, and cost expenditures.

Task B-10. Preparation of Comprehensive, Interpretive Final Report

The Contractor shall prepare a comprehensive, interpretive final report of all data, measurements, observations, and findings generated in this source tracking study. The report shall integrate the conclusions reached into a holistic presentation and summary of results.

The report shall compare the concentration data produced on this study with post-cleanup and final surface-weighted average concentration goals (see page 3) established for the Ottawa River remediation project. The report shall offer an assessment as to whether additional studies are required to determine the probable need for further remediation action in Reach 5.

Assuming that all analytical requirements are completed by November 30, 2011, the draft final report shall be submitted to ORD/GLNPO by January 31, 2012. ORD/GLNPO will review the draft report, request changes as needed, and return the draft report for corrections to the Contractor by February 28, 2012. The Contractor shall submit the corrected final interpretive report to ORD/GLNPO for review and approval by March 31, 2011.

CBI APPLICABILITY

CBI does not apply.

APPLICABLE CONTRACT TASKS

This work assignment titled "Joint U.S. EPA ORD/GLNPO Evaluation of Remedy Effectiveness and Tracking of Potential Additional Contamination Sources for the Ottawa River Environmental Dredging Project" relates to Task 1 (Collection and Analysis of Data) and Task 3 (Physical Testing) of the current SOW for this contract.

PERFORMANCE MEASURES

The Contractor's performance will be judged by: 1) timeliness in meeting the various completion dates of the nine field and analytical tasks (Tasks A-2 through A-10) described above for Part A of this work assignment, the six field and analytical tasks (Tasks B-3 through B-9) described above for Part B of this work assignment, the completion date (March 31, 2012) of the draft final report cited above for Part A of this work assignment, and the completion date (January 31, 2012) of the draft final report cited above for Part B of this work assignment; and 2) accuracy and thoroughness in satisfactorily addressing and conducting all elements of Parts A and B of this Statement-of-Work (SOW) as described in the Contractor's Technical Work Plan and the new QAPP to be prepared for Part B of this project.

The Government will review the Contractor's promptness in meeting the specified completion dates for the above three areas of the new Part B QAPP, Parts A and B field tasks, and Parts A and B analytical tasks plus the draft final data report dates for Part A and Part B. If the

Contractor is late by more than 7 days in meeting any of the field and analytical completion dates, a 5% reduction in fee will be applied by the Government. If the Contractor is late by more than 7 days in meeting the completion date for either the draft final report for Part A or the draft final report for Part B, a 5% reduction in fee will be applied by the Government. If the Contractor is late by more than 7 days in meeting any of the field and analytical completion dates plus the Part A and Part B draft final data report completion dates, a 10% reduction in fee will be applied by the Government. The reduction in fee will also increase to 10% if the Contractor is more than 14 days late in meeting any of the above completion dates. The reduction in fee will increase to 20% if the Contractor is more than 30 days late in meeting any of the above completion dates. Subject reductions in fee will not apply if it is determined that delayed completion is due to the Government for any reason. Said reductions also will not apply if delayed completion is due to unavoidable adverse weather conditions.

The Government will also review the Contractor's accuracy and thoroughness in addressing and carrying out the technical requirements of their Work Plan and the quality assurance requirements of QAPP Addendum for Part B of this work assignment. The Government acknowledges that assessment of accuracy and thoroughness can be subjective and will consult with the Contractor prior to making any final determinations. After due deliberations, if the Government determines that the Contractor has not satisfactorily addressed one or more technical elements or quality assurance requirements, a 10% reduction in fee will be applied to each element and/or requirement. As above, subject reductions in fee will not apply if, for any reason, Government actions have resulted in non-acceptable performance. If reductions in fee are deemed appropriate, they will apply to both paid and unpaid fees.

PERIOD OF PERFORMANCE

This work assignment is projected to begin on June 23, 2011 and will extend through June 22, 2012.

LEVEL OF EFFORT

This Work Assignment is estimated to require 5,951 professional hours to complete all tasks.

U.S. EPA ORD CONTACTS

1. Work Assignment Manager

Richard C. Brenner
Environmental Engineer
Soils and Sediments Branch
Land Remediation and Pollution Control Division
National Risk Management Research Laboratory, MS 190
Cincinnati, OH 45268
Office Phone: 513/569-7657
Cell Phone: 513/310-2999
Fax: 513/569-7620

e-mail: brenner.richard@epa.gov

2. Alternate Work Assignment Manager

Marc Mills
Environmental Engineer
Soils and Sediments Branch
Land Remediation and Pollution Control Division
National Risk Management Research Laboratory, MS 190
Cincinnati, OH 45268
Office Phone: 513/569-7322
Cell Phone: 513/633-8487
Fax: 513/569-7620
e-mail: mills.marc@epa.gov



Figure A-1. Ottawa River GLLA Project Overview Map Showing River Mile Delineations for the Four Reaches

Figure A-2

**Ottawa River GLLA Maps of Dredge
Management Units (DMUs) for Reaches 2, 3, and 4**

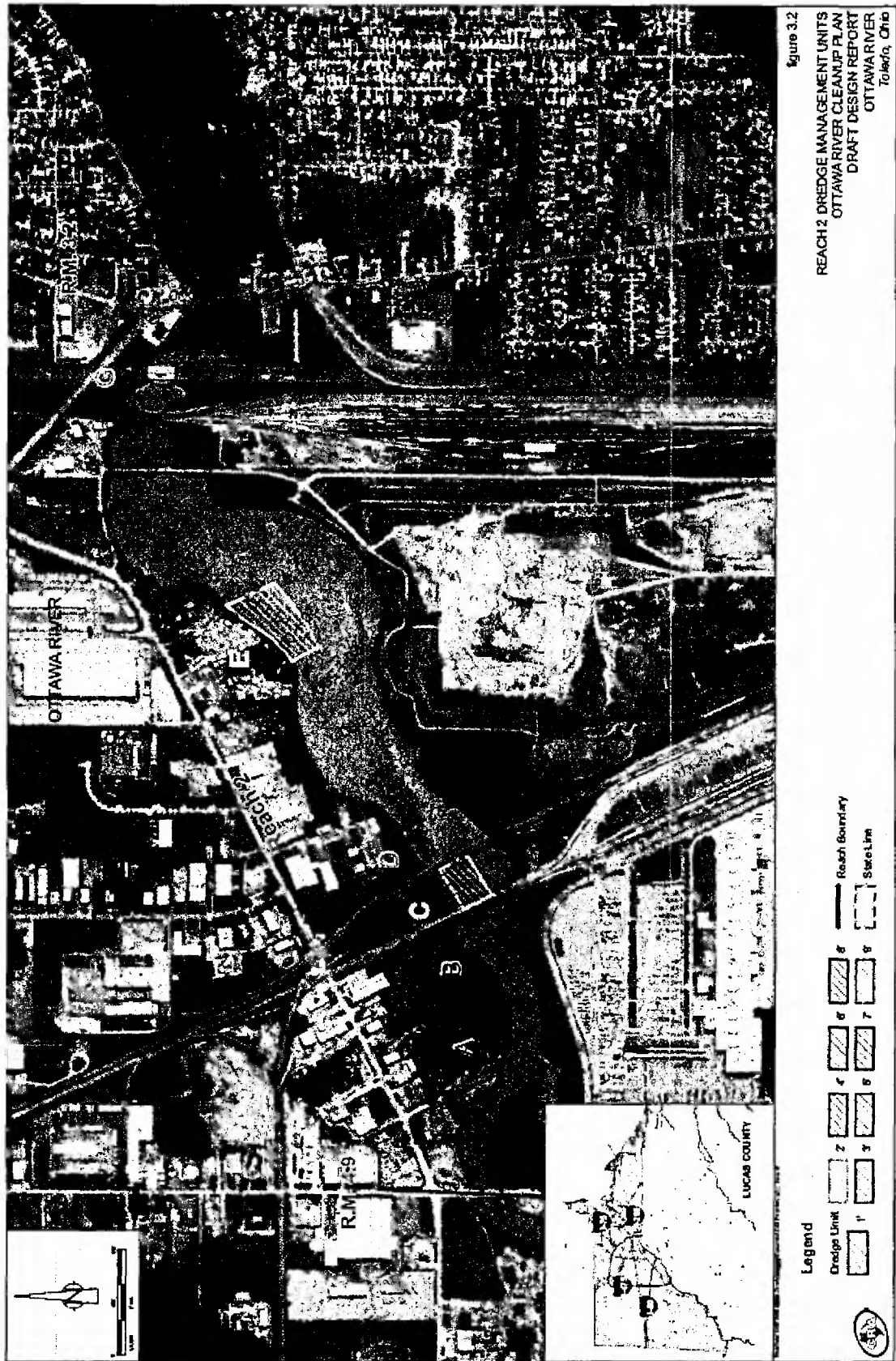
Consisting of the Following Four Maps

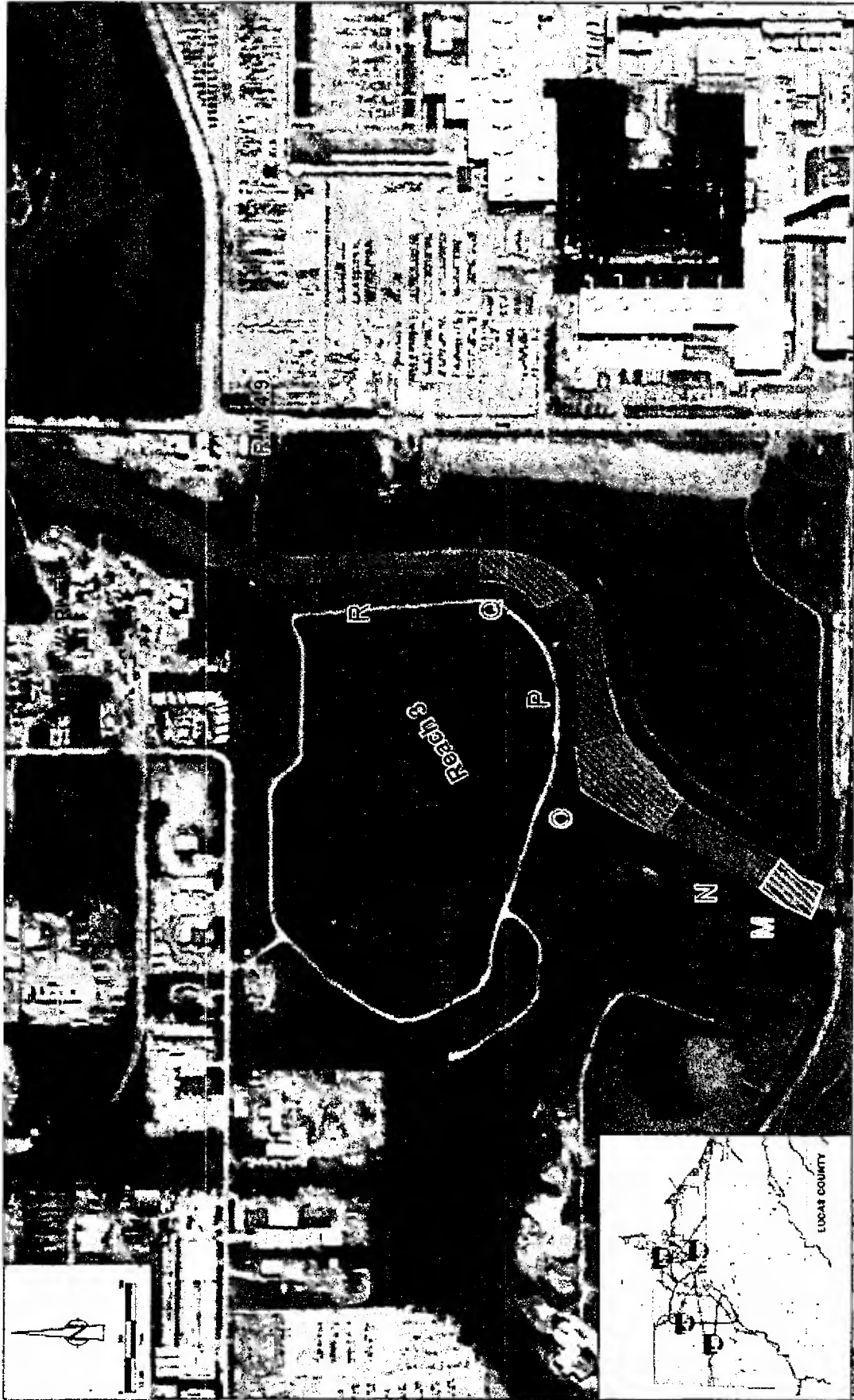
Figure 3.2 - Reach 2

Figure 3.3 - Upper Reach 3

Figure 3.4 - Lower Reach 3

Figure 3.5 - Reach 4





Legend

	1		2		3		4		5		6		7		8		9
--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---

Reach Boundary

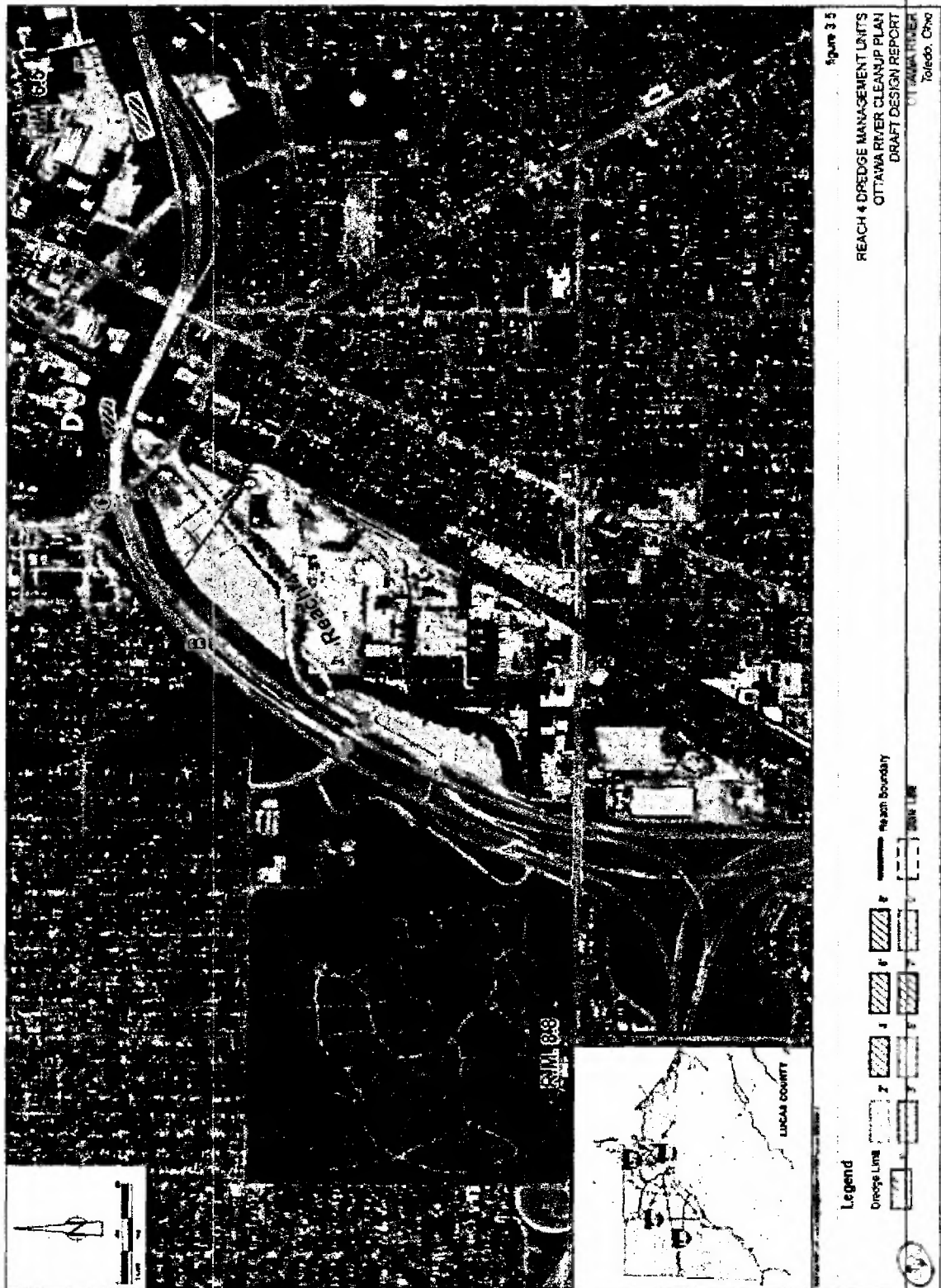
Reach Boundary

State Line

State Line

UPPER REACH 3 DREDGE MANAGEMENT UNITS
OTTAWA RIVER CLEANUP PLAN
DRAFT DESIGN REPORT
OTTAWA RIVER
Toledo, Ohio





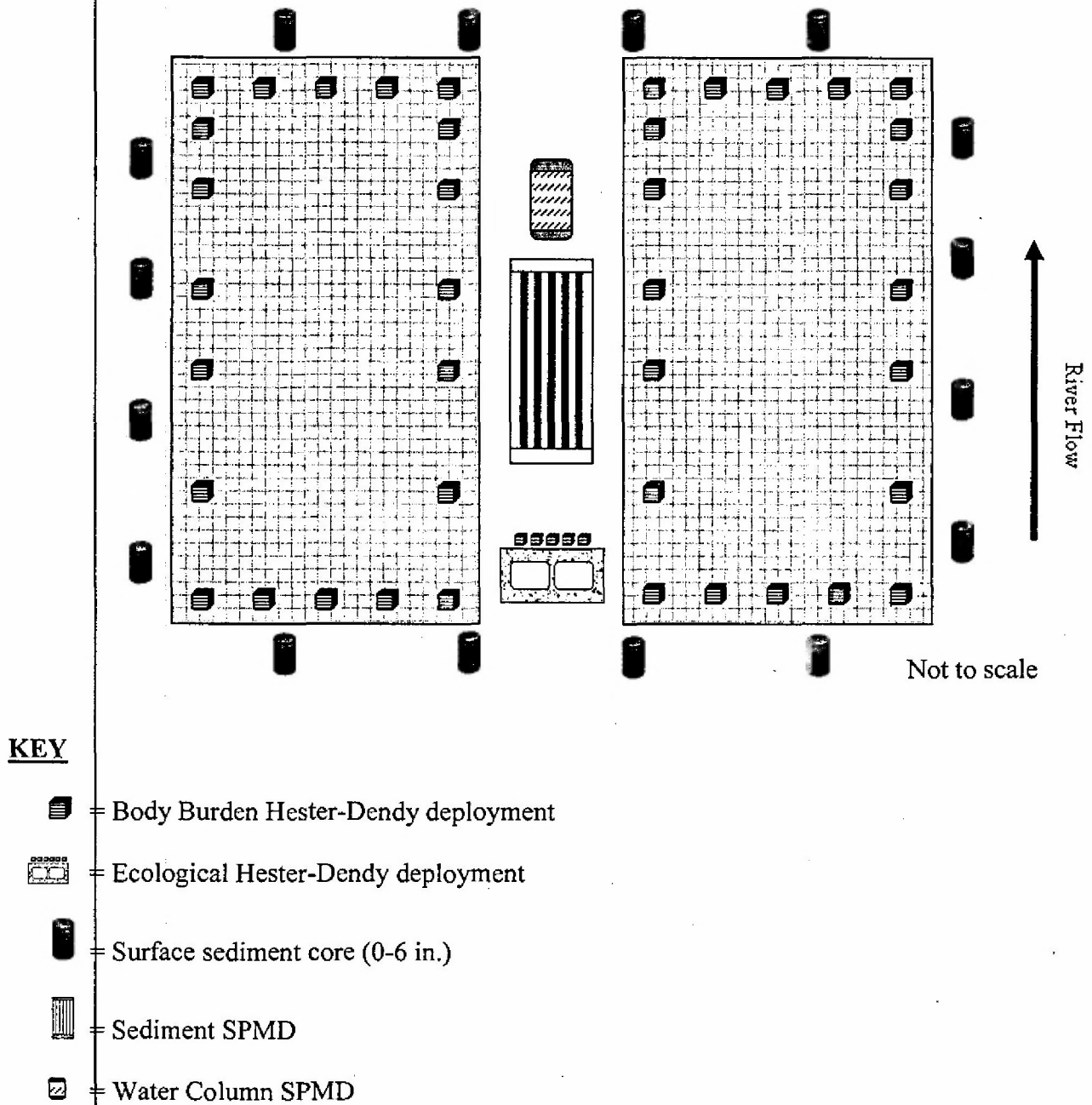


Figure A-3. Plan View Conceptual Layout of Hester-Dendy Devices, Passive Sampler Deployments, and Surface Sediment Sampling Locations

Table A-1. Target Coordinate Locations for Hester-Dendy Deployments, Passive Sampler Deployments, and Surface Sediment Sampling

Reach	Dredge or Non-Dredge	Ohio EPA River Mile (RM) Designation/Date	Type of H-D Deployment	Latitude Coordinate	Longitude Coordinate
2	No	RM 3.5 (2000, 2007)	ECO+BB**	41.7111306	83.5048333
2	Yes, B*	RM 4.6 (2007)	ECO+BB	41.7023333	83.5198333
2	Yes, A	RM 4.9 (1986, 1992)	BB	41.7030979	83.5251882
2	No	RM 4.5	BB	41.7035827	83.5175179
2	Yes, D	RM 3.9	BB	41.7079263	83.5105703
2	No	RM 3.7	BB	41.7100643	83.508369
3	Yes, N	RM 5.5 (1996, 2002, 2007)	ECO+BB	41.6965556	83.5314444
3	No	RM 6.2 (2007)	ECO+BB	41.6901944	83.5393611
3	Yes, P	RM 5.3 (1996, 2002, 2007)	BB	41.6986944	83.5297778
3	No	RM 5.0 (2002, 2007)	BB	41.7030833	83.52825
3	Yes, L	RM 5.8 (1999, 2001, 2002, 2007)	BB	41.6940555	83.5350277
3	No	RM 6.1 (1999, 2000, 2001)	BB	41.6912311	83.5373787
4	No	RM 6.8 (2007)	ECO+BB	41.6878056	83.5503056
4	Yes, C	RM 7.4 (1986)	ECO+BB	41.6874365	83.563118
4	No	RM 8.0 (2007)	BB	41.6819639	83.5682611
4	Yes, D	RM 7.3 (2000)	BB	41.6877788	83.5616972
4	No	RM 8.6 (2007)	BB	41.6765	83.5741944
4	Yes, A	RM 8.4	BB	41.678475	83.5729971

* Letter designations refer to specific planned dredged zones within each reach.

Figure B-1. Proposed Transects for Source Tracking in Reach 5 of the Ottawa River

Figure B-2. Schematic Depicting Generalized Placement of SPMDs, Bivalves, and Sediment Traps at One Transect in Reach 5 of the Ottawa River

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-11

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2009 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

QA Support for Taxonomic Eval

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

1.2.b

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 06/29/2011 To 06/22/2012

Comments:

The technical and financial work plan is approved.

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

06/23/2009 To 06/22/2012

Cost/Fee: \$0.00

LOE:

This Action:

\$0.00

Total:

\$0.00

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

07/15/2011

Cost/Fee: \$127,434.00

LOE: 542

Cumulative Approved:

Cost/Fee: \$127,434.00

LOE: 542

Work Assignment Manager Name Marla Smith

(Signature)

(Date)

Branch/Mail Code:

Phone Number 202-566-1047

FAX Number:

Project Officer Name Cynthia Bowie

(Signature)

(Date)

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

Other Agency Official Name

(Signature)

(Date)

Branch/Mail Code:

Phone Number:

FAX Number:

Contracting Official Name Christine Edwards

(Signature)

(Date)

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment		Work Assignment Number 2-11								
		<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:								
Contract Number EP-W-09-024	Contract Period 06/23/2009 To 06/22/2012 Base Option Period Number 2	Title of Work Assignment/SF Site Name Taxonomic ID and Comparisons								
Contractor BATTELLE MEMORIAL INSTITUTE		Specify Section and paragraph of Contract SOW 1.2.b								
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval		Period of Performance From 06/29/2011 To 06/22/2012								
Comments: Work Assignment Initiation - A Technical and Financial Work Plan is required. Currently, there are 480 Professional Labor Hours allocated for this Work Assignment.										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO (Max 2) <input type="checkbox"/> Note: To report additional accounting and appropriations data use EPA Form 1800-89A.										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period: 06/23/2009 To 06/22/2012		Cost/Fee:		LOE:						
This Action:										
Total:										
Work Plan / Cost Estimate Approvals										
Contractor W/P Date:		Cost/Fee:		LOE:						
Cumulative Approval:		Cost/Fee:		LOE:						
Work Assignment Manager Name Marla Smith		(Signature) _____ (Date) _____		Branch/Mail Code: Phone Number 202-566-1047 FAX Number:						
Project Officer Name Cynthia Bowie		(Signature) _____ (Date) _____		Branch/Mail Code: Phone Number: 202-564-7726 FAX Number:						
Other Agency Official Name		(Signature) _____ (Date) _____		Branch/Mail Code: Phone Number: FAX Number:						
Contracting Official Name Christine Edwards		(Signature) <i>K. Barton for</i> (Date) 6/29/11		Branch/Mail Code: Phone Number: 202-564-2182 FAX Number:						

Contract No. EP-W-09-024
Work Assignment 2-11

TITLE: **Taxonomic Identifications and Comparisons for 2010 National Coastal Condition Assessment**

Purpose:

This work assignment is a continuation of work started under Contract Number EP-W-09-024, Work Assignment 1-09. This work assignment does not duplicate any work in the previous work assignment. The project schedule was delayed, so the majority of the work tasked in WA 1-09 will now be provided by this follow-on work assignment, WA 2-11.

The purpose of this work assignment is for the contractor to provide quality assurance support in taxonomic evaluation for NCCA.

I. BACKGROUND

Numerous reports have identified the need for improved water quality monitoring and analysis at a local, state, or national scale to help determine the condition of U.S. waters and watersheds. The document "Guidelines for the Award of Monitoring Initiative Funds under Section 106 of the Clean Water Act" provides the foundation for the states, EPA, and other partners to collaborate on statistically-valid surveys of water condition at nationwide and regional scales, for all waterbody types, to improve water quality monitoring and decision making. Collectively, the surveys are called the "National Aquatic Resource Surveys." This Work Assignment will support EPA's quality assurance for the survey of coastal areas and Great Lakes.

The National Coastal Condition Assessment (NCCA) sampled more than 1300 sites within U.S. coastal waters and Great Lakes during the summer of 2010. National and state laboratories are currently analyzing samples for benthics and other analyses. Macrobenthic organisms collected and preserved at each site. At the laboratory, preserved composite samples are first be sorted into major taxon groups which then will be further identified to the species level, or lowest practical taxonomic unit, using specified standard keys and references. A 10% external check is standard practice for NARS with a requirement that results agree within 15%. The laboratories are currently processing the NCCA samples, and EPA would like to conduct the QA component of taxonomic identifications concurrently with the sample processing.

II. SCOPE OF WORK

Task 1: Workplan and Cost Estimate

The contractor will provide a work plan that describes the support that will be provided; identifies deliverables; and identifies potential problems that may arise in completing this work assignment on schedule and within budget.

The contractor shall provide overall work assignment management and interface with the EPA WAM.

Task 2: Quality Assurance Plan

The contractor shall adhere to the NCCA Quality Assurance Project Plan and the contractor's Quality Assurance Plan (QAP) that EPA approved under WA 1-09. In addition, the contractor shall document relevant QA activities in any deliverable.

Task 3: Taxonomic Quality Control for Benthic Samples (SOW 1.2.b)

The contractor shall provide QA/QC checks for internal taxonomy accuracy on re-samples for benthic macroinvertebrates. (QC taxonomist would only be re-counting the already sorted and mounted material.)

- a. **Selection and Transfer of Samples:** The contractor's project facilitator will randomly select benthic samples from each lab ("primary") to be sent to the QC taxonomists ("secondary"), experienced taxonomists who did not participate in the original identifications.
 - i. The project facilitator shall select 10% of the completed samples at predetermined number of samples (e.g., every 100 samples) or when each laboratory completes its sample analyses. For labs processing less than 30 samples, a minimum of three samples must be selected.
 - ii. From each lab, the project facilitator will coordinate delivery of the selected samples, bench sheets, chain-of-custody form, taxon reference (or key), lab protocol (if not collected as part of the audit in Task 2).
 - Copies of correspondence with the laboratory should be provided to the EPA WAM. If the laboratory is a subcontractor or run/contracted by the state, copies also shall be provided to the prime contractor/state.
 - Because the facilitator is coordinating the delivery, the workplan should include delivery costs for the transfers.
 - The table identifies the benthic labs.
 - iii. The proposed QC taxonomists must have demonstrated expertise and experience to be used as a quasi "gold standard" for freshwater and/or marine taxonomic evaluations. The workplan should describe their qualifications and experience.

Table: Benthic Labs and locations

(b)(4)

- b. **Independent Evaluation by Expert Taxonomist:** The contractor's QC taxonomist will perform whole-sample re-identifications, with care taken to ensure inclusion of all slide-mounted specimens, completing a separate copy of the taxonomic bench sheet for each sample. The bench sheet must be compatible with EPA's database and labeled with the term "QC Re-ID." The QC taxonomist's review must be independent, and thus, must not have access to the original laboratory results. The EPA WAM will provide a draft list of species that may vary depending on

sample location. If necessary, the project facilitator should obtain localized specie lists from the laboratories.

- c. **Comparison of Primary and Secondary Results:** For each sample, the contractor will compare the taxonomic results (counts AND identifications) generated by the laboratory and the QC taxonomist. The comparison shall evaluate the percent disagreement in enumeration (PDE) and percent taxonomic disagreement (PTD) calculated as shown in the Laboratory Manual.
- d. **Reconciliation:** The project facilitator shall coordinate conference calls with the primary and secondary taxonomists and EPA to reconcile the results for which the PDE and/or PTD differ by more than 15%. Before the meeting, the project facilitator shall provide the list of samples to be reconciled to the primary lab and EPA. At the conclusion of the call, the project facilitator shall transfer the appropriate samples to the primary lab for reconciliation. However, if it does not appear that the primary lab will be able to reconcile the results to meet the 15% requirement, the contractor shall provide EPA with a memorandum that summarizes the teleconference and provides recommendations for next steps. (EPA will issue an amendment if it is necessary.) The contractor shall have 1-2 calls with the combined national laboratories and one call with the laboratories in each region (total number of calls is 5-6). The national calls are likely to be approximately three hours each. The regional calls are expected to be substantially shorter because there are relatively few samples under evaluation.
- e. **Report:** After all reconciliation teleconferences are completed, the contractor will provide a report or technical memorandum to the EPA WAM that quantifies taxonomic precision; assesses data acceptability; highlights taxonomic problem areas; provides recommendations for improving precision; includes summary statistics of precision; attaches a table with the three results (i.e., primary, secondary, and reconciled results) with the PDE and PTE; provides summary statistics about the overall precision; identifies the randomization method used to select the samples; and includes the equations used for the comparisons. Also, the contractor will provide a database with the secondary and reconciled bench sheets and data. This format must be compatible with the established database structure for each survey.

III. DELIVERABLES AND SCHEDULE:

Task	Task Description	Deliverable transmitted by email or file exchange	Date
1.	Work plan	Work plan	Due 15 calendar days following receipt of Work Assignment.
2.	Quality Assurance Plan	Quality Assurance Plan	QAP applies always. QA documented in all deliverables.
3.	Taxonomic Comparison	status reports on number of samples evaluated	with monthly progress report
		correspondence identifying selection and delivery of selected samples	Appropriate time periods depending on lab schedule for processing samples
		Comparison of independent results with lab results	one week after evaluating each predetermined number of samples
		Reconciliation teleconferences	Dates and times depend on availability of EPA WAM and laboratory representatives
		Report	Draft two weeks after the final reconciliation teleconference. Final version two weeks after receiving EPA comments.

IV. PERIOD OF PERFORMANCE: CO Approval through October 31, 2011

V. LEVEL OF EFFORT: 480 technical hours

VI. EPA CONTACT:

Work Assignment Manager (WAM):

Marla D. Smith
phone: 202-566-1047
e-mail: smith.marla@epa.gov

USPS Address:

U.S. EPA (4303T)
1200 Pennsylvania Avenue NW
Washington, DC 20460

Overnight Courier Address:

U.S. EPA
6231B EPA West
1301 Constitution Avenue, NW
Washington, DC 20004

Appendix A (Draft) Contact Information for Benthic Labs

National Laboratories:

Sediment Chemistry and Fish Contaminants:

Contacts:

The Cadmus Group

(b)(4)

(Project Manager and Primary Point of Contact)

Phone: 617-

(b)(4)

Email:

(b)(4)

@cadmusgroup.com

Cadmus subcontractor:

(b)(4)

Locations:

(b)(4)

(b)(4)

Region 3: two benthic laboratories

Region 3 contacts:

Bill Richardson (richardson.william@epa.gov)

Larry Merrill (merrill.larry@epa.gov)

Maryland:

State DEQ staff overseeing state laboratories:

Catherine Wazniak, Program Chief,

Integrated Assessment

MD Department of Natural Resources

580 Taylor Ave, D2

Annapolis, MD 21401

cwazniak@dnr.state.md.us

Benthics laboratory:

(b)(4)

Virginia:

State DEQ staff overseeing state laboratories:

Don Smith

donald.smith@deq.virginia.gov

VADEQ,

Water Quality Monitoring and Assessment

629 East Main Street

Richmond, VA 23219

Cindy Johnson (coordinator)

804-698-4385

cindy.johnson@deq.virginia.gov

Virginia:

Department of Biological Sciences

Old Dominion University

Norfolk, VA 23529-0266

Dr. Dan Dauer, Director

(757) 683-4709

ddauer@odu.edu

and

Anthony (Bud) Rodi (primary technician),
(757) 683-6090

arodi@odu.edu

Region 4:

Region 4 contacts:

Dave Melgaard (melgaard.david@epa.gov)

Jim Harrison (harrison.jim@epa.gov)

South Carolina

SC DHEC staff overseeing state laboratories:

David Chestnut, Senior Scientist

Bureau of Water Quality Monitoring Section

South Carolina Department of Health & Environmental Control

2600 Bull Street Columbia, SC 29201

803-898-4066

chestnde@dhec.sc.gov

SC Benthics Lab:

Dr. Derk C. Bergquist

Marine Resources Research Institute

217 Fort Johnson Road

Charleston, SC 29412

phone: (843) 953-9074

email: bergquistd@dnr.sc.gov

Region 5:

Region 5 contacts:

Mari Nord (nord.mari@epa.gov),

Jonathan Burian (burian.jonathan)

Ed Hammer (hammer.edward@epa.gov)

Wisconsin:

University of Wisconsin – Stevens Point

Jeff Dimick

jdimmick@uwsp.edu

Region 9:

Region 9 contacts:

Janet Hashimoto (hashimoto.janet@epa.gov)

Terry Fleming (fleming.terrance@epa.gov)

CA:

Main point of contact for all analyses is:
Rusty Fairey (works for State of CA, Dept. of Fish and Game)
Moss Landing Marine Lab
(831) 771-4161
fairey@mlml.calstate.edu

Benthic Laboratory:
Jim Oakden
Moss Landing Marine Laboratories
Moss Landing, CA. 95039
oakden@mlml.calstate.edu

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-12

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2011 To 06/22/2012

Base Option Period Number 2

Title of Work Assignment/SF Site Name

Measurement and Evaluation Pla

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks II Data Analysis

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 07/18/2011 To 03/31/2012

Comments:

☐ Superfund

Accounting and Appropriations Data

☒ Non-SuperfundSFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

06/23/2011 To 06/22/2012

Cost/Fee: \$0.00

LOE:

This Action:

\$0.00

Total:

\$0.00

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

01/26/2012

Cost/Fee:

\$33,379.00

LOE: 166

Cumulative Approved:

Cost/Fee:

\$33,379.00

LOE: 166

Work Assignment Manager Name Rebecca Cool

Branch/Mail Code:

Phone Number 202-564-9138

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-12

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2009 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Measurement & Evaluation Plan

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 2

Purpose:



Work Assignment



Work Assignment Close-Out



Work Assignment Amendment



Incremental Funding



Work Plan Approval

Period of Performance

From 07/18/2011 To 10/31/2011

Comments:

Work Assignment Initiation

Currently, there are 210 Professional Labor Hours (PLHs) allocated for this Work Assignment.



Superfund

Accounting and Appropriations Data



Non-Superfund

SFO
(Max 2)

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee:

LOE:

06/23/2009 To 06/22/2012

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name Rebecca Cool

Branch/Mail Code:

Phone Number 202-564-9138

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

Contract Number: EP-W-09-024

Work Assignment: 2-12

Title: Measurement and Evaluation Plan for the E3 (Economy, Energy, and the Environment) Initiative.

Purpose:

This work assignment will provide support for the development of a Measurement and Evaluation Plan for the E3 (Economy, Energy, and Environment) Initiative. This work assignment is a continuation of the work started under Contract Number EP-W-09-024, Work Assignment 0-14. This work assignment does not duplicate any work in the previous work assignment. **This statement of work is a continuation of work under Task 1: Measurement and Evaluation Plan and Task 2: Forecasting Tools**

I. Background:

The E3 initiative is a collaboration among the U.S. EPA, the Department of Energy, the Department of Commerce, the Department of Labor, and the Small Business Administration to bring economic prosperity, energy efficiency, and environmental stewardship to communities. This initiative involves city government, local environmental and lean experts, a local utility, utility customers and/or suppliers, and federal agencies. It pulls together federal, state and local resources to provide technical assistance in lean and clean, energy efficiency and carbon foot-printing to utility customers and/or suppliers to reduce the environmental impact on a community-wide basis.

The initiative integrates the EPA's Green Suppliers Network 'lean and clean' process review with the Department of Energy's on-site energy audit into one customized technical review. Manufacturers receive a detailed report with specific strategies for reducing their waste and using materials and energy more efficiently. Through the EPA's Climate Leaders program, manufacturers also receive a Greenhouse Gas Evaluation that includes on-site technical resources to help them establish their own carbon footprint, using the Climate Leaders new simplified GHG calculator.

Under this initiative, pilot projects are currently being conducted in San Antonio, Texas, and Columbus, Ohio, and are being supported in large part by the Manufacturing Extension Partnership program of NIST and its contractor, and the Department of Energy's Industrial Technologies Program and its network of Industrial Assessment Centers.

The outcome of a one-day workshop on measuring "technical assistance program effectiveness," currently planned for mid-November 2009, should be extremely helpful in developing a Measurement and Evaluation Plan for E3. The results of this workshop will be made available to the contractor to use in development of the measurement and evaluation plan for E3.

This workshop will assemble a small group of experts in the field of measuring "technical assistance program effectiveness." These technical assistance programs include both pollution prevention as well as energy efficiency programs. The objectives of this workshop are to:

- Examine the current state of thinking about how program effectiveness can be/is being measured, for programs seeking to influence business and individual behavior with respect to energy efficiency and environmental management.
- Explore the development of predictive models of program impact which might help program managers better understand the relationship between programmatic activities, such as outreach, education, network creation, and desired environmental/energy outcomes.
- Determine what data are required to construct or operate such models, and identify gaps in current data collection practices.
- To identify key functional attributes/requirements of future data systems intended to manage the effectiveness of such programs.

II. Scope of Work:

Task 1: Measurement and Evaluation Plan for E3

The contractor shall assemble a workgroup of technical experts in the field of program effectiveness measurement. The individuals selected by the contractor shall be provided to the WAM for approval. This workgroup shall meet between 3-5 times during the performance period of the contract.

Using the recommendations of the technical experts workgroup, as well as the recommendations of the conference described above, the contractor shall develop a draft blueprint for the 5 federal agencies (EPA, DOE, DOC/NIST/MEP, DOL, and the SBA) participating in the E3 initiative that identifies the most appropriate ways to collect direct impacts data. This blueprint will address the individual reporting requirements of all 5 agencies as well as the collective reporting requirements for E3. The contractor shall verify the recommended approach with various local technical assistance providers. Based on the feedback received, the contractor shall develop final recommendations on the most effective information gathering devices to collect information necessary to fully evaluate the effectiveness of the E3 program. This blueprint shall assist in the development of a sophisticated data collection instrument that shall demonstrate direct causal links for all E3 impacts including, energy and environmental outcomes.

1a: The contractor shall present the draft E3 Measurement Plan to the E3 team and stakeholders as specified by the EPA project manager to solicit comments. Any necessary revisions based on these comments will be incorporated into a final version of the E3 Measurement Plan which will be issued as a part of this task.

Task 2: Forecasting Tools

The contractor shall develop a set of forecasting tools that will help program managers project the outcomes of different program investment options and strategies.

2a: The contractor shall use Illinois ICORE data as well as field data from at least one additional state program to calibrate and validate the model that has been developed. The contractor shall also attend an interagency meeting convened by EPA to present the model and discuss data sources and performance measurement. The contractor shall also insure that the E3 model is installed and running correctly on at least two computers accessible to EPA.

III. Deliverables:

Task	Deliverable	Due Date
	Work Plan	15 calendar days after contractor receives the work assignment
1	Documented Measurement and Evaluation Plan	30 days following approval of the work plan
2	Forecasting Tools	60 days following the approval of the work plan

This work assignment relates to Tasks II. Data Analysis of the current Statement of Work (SOW) of the contract.

IV. Period of Performance:

This work assignment will start on the date of the contracting officer's signature and extend through October 31, 2011.

V. Level of Effort:

This work assignment shall require 210 professional hours.

VI. EPA Contacts:

Contracting Officer Representative:

Rebecca S. Cool

Pollution Prevention Division (7409M)

Voice: 202-564-9138

Fax: 202-564-8901

Email: cool.rebecca@epa.gov

Mailing Address:
1200 Pennsylvania Ave. NW
Washington, DC 20460

Delivery Address:
Room 5303EE, EPA East
1201 Constitution Ave. NW
Washington, DC 20004

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2011 To 06/22/2012

Base Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Dredging Eval.

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

This action approves the contractor's work plan dated 04/16/2012.

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

06/23/2011 To 06/22/2012

Cost/Fee: \$483,055.00

LOE:

This Action:

\$0.00

Total:

\$483,055.00

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

04/19/2012

Cost/Fee:

\$204,937.00

LOE:

1,315

Cumulative Approved:

Cost/Fee:

\$835,045.00

LOE:

5,340

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other ☒ Amendment Number:

000003

Contract Number

EP-W-09-024

Contract Period 06/23/2011 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Environmental

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☒

Work Assignment Amendment

☐

Incremental Funding

☐

Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

WP Approved Totals: Base, 3,140.25 hr LOE, Cost plus Fee \$481,149
" " : Amend. 1, 154.25 hr LOE, Cost plus Fee \$ 24,297
" " : Amend. 2, 731.00 hr LOE, Cost plus Fee \$124,662

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO

(Max 2)

☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee:

LOE:

06/23/2011 To 06/22/2012

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor W/P Dated:

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

**STATEMENT-OF-WORK FOR AMENDMENT 3
EXPANSION OF FINAL REPORT**

CONTRACT NUMBER: EP-W-09-024

WORK ASSIGNMENT: 2-13 (Performance Based)

**TITLE: Joint U.S. EPA ORD/GLNPO Evaluation of Remedy Effectiveness
and Development of Site Delisting Lines-of-Evidence for the
Ashtabula River Environmental Dredging Project**

**PROJECT ADMINISTRATOR: U.S. Environmental Protection Agency
Office of Pollution Prevention and Toxic Substances
Washington, DC**

PROJECT CONTRACTOR: Battelle Memorial Institute, Columbus, OH

INTRODUCTION AND BACKGROUND

With the impending completion of Amendments 1 and 2 to this Work Assignment (WA) 2-13, preparation of the final report for this 6-year project is the sole remaining task for said work assignment. When this project was initiated in 2006, the Agency's plan included before dredging and immediate-post-dredging characterization of the Ashtabula River sediment inventory and the associated ecosystem, water column and resuspension monitoring during dredging, and perhaps one additional follow-up sediment residual and ecosystem characterization several years following completion of dredging. In reality, U.S. EPA ORD/GLNPO have decided over the ensuing years to implement yearly evaluations of dredge residual status and/or recovery of the river ecosystem. Consequently, the number of dredge residual samplings, Hester-Dendy (HD) and semi-permeable membrane device (SPMD) deployments and retrievals, and fish and food web collections have significantly increased. The associated physical and chemical analyses required to document sediment and receptor contaminant concentrations have expanded the database far beyond what was originally anticipated. This database has been enlarged further by authorization of Amendments 1 and 2 to conduct a source tracking study in Field Brook and to investigate potential 'hot spot' areas of high PCB concentrations in the North Slip of Jack's Marine.

In view of the greatly expanded database that has resulted from the extended duration of this study, the final report envisioned at the beginning of the project is inadequate to comprehensively address and process all of the data integrations and comparisons, forensics issues, plume tracking and bathymetry interpretations, and tools evaluations, as well as the sheer volume of data generated, to produce the length and quality of final report necessary to justify the effort and financial commitment invested in this project. ORD/GLNPO agree that a substantially longer and more comprehensive, interpretive report is required and justified. Toward this end, ORD/GLNPO have pursued discussions that have resulted in an expanded, more comprehensive and inclusive final report outline. This outline is attached as Figure 1.

The focus of this amendment is the provision of instructions to prepare a final report for the Ashtabula River Environmental Dredging Evaluation in accordance with subject revised outline. In addition, the contractor will be requested to provide assistance in finalizing several related ORD deliverables sediment remediation and sludge disposal.

DESCRIPTION OF TASKS

Task 1. Development of Technical and Financial Work Plans

Inasmuch as the contractor has been intimately involved in the preparation of the revised final report outline and further as said revised outline is self explanatory, the contractor shall not be required to prepare a Technical Work Plan for Amendment 3. The contractor shall prepare a Financial Work Plan for carrying out the three tasks described below. The cost of the revised final report shall consider only those costs over and above those funds remaining (i.e., unexpended funds) in the original budget for the WA 2-13 final report task. The Financial Work Plan shall present cost and level-of-effort (LOE) breakdowns for each individual task and for all three tasks in total. The Financial Work Plan shall be submitted within 15 days of the contractor receiving a work assignment from the U.S. EPA Contract Officer.

Task 2. Preparation of Expanded Final Report

The contractor shall prepare a revised, expanded final report for this project that comprehensively addresses and incorporates all elements of the attached final report outline (see Figure 1). The contractor shall emphasize interpretation of individual matrix results and, where feasible, defining and/or inferring data relationships between matrices. A weight-of-evidence approach shall be utilized in assessing data and drawing conclusions therefrom. This report shall focus on the evaluation of the remedy effectiveness goals of this study. Evaluation of data to be used by GLNPO for site closure/delisting purposes is not an objective of this report. This element of the study shall be referred to only in relation to its impact on the manner in which the overall project was planned and implemented.

The due date for the final report is June 22, 2012, the end of Option Period 2 for this contract. The final report shall be formatted to be 508 Compliant. In developing its schedule to meet this completion date, the contractor shall allow for two U.S. EPA report review iterations. The first iteration shall allow for 2 weeks of U.S. EPA review time; the second iteration need only allow for 1 week. If convenient and deemed time efficient, the contractor may submit first drafts of individual sections as they are completed and ready for review.

Task 3. Assistance with Finalization of Related ORD Deliverables

The contractor shall provide up to 40 P-4 level hours and up to 16 P-3 level hours to assist in finalizing one or two related sediment remediation and sludge disposal ORD deliverables. Specific instructions will be provided to the contractor regarding assistance needed when these deliverables are ready for finalization (anticipated to be during April 2012).

**TABLE 1. OUTLINE FOR ASHTABULA RIVER INTERPRETIVE FINAL REPORT
(March 13, 2012)**

DRAFT OUTLINE

**NOTICE
FOREWORD
CONTENTS
FIGURES
TABLES
APPENDICES
ACRONYMS AND ABBREVIATIONS
ACKNOWLEDGEMENTS
EXECUTIVE SUMMARY**

1. INTRODUCTION

Include statement summarizing Agencies and roles

- ORD Goals: Evaluate selected methods and tools to characterize and predict residual contamination following environmental dredging.
- GLNPO Goals: Conduct preremedial characterization and post remedy sampling to demonstrate remedy effectiveness; support BUI removal and delisting.

1.1. Project Summary

- Describe the overall effort including EPA GLNPO, EPA ORD, and Battelle.
- Provide time line.
- ORD Project Purpose: "Evaluate methods and tools to assess the remedy effectiveness of environmental dredging through long-term evaluation of both sediment and ecosystem characteristics".
- The ORD project goal was not designed initially to evaluate the remedy effectiveness at Ashtabula, but to evaluate selected tools and methods. Over time and in cooperation with GLNPO, an additional goal was developed to provide data and evidence required for delisting the site and to evaluate a variety of tools implemented to assess remedy effectiveness of environmental dredging on the Ashtabula River.

1.2. Description of project area , reference site, and historical contamination; summarize dredging activities and field activities; list previous investigations and reports.

1.3. Report Goals and Objectives (Battelle to draft and EPA to review)

- Evaluate selected methods and tools to conduct a remedy effectiveness assessment of environmental dredging.

2. EXPERIMENTAL APPROACH AND DATA COLLECTION METHODS

2.1. General Approach (Battelle to draft and EPA to review)

Reference two previous reports (2010 Sediment Residuals report and 2011 Biologicals report), but will need a summary at a minimum. This report will need to be able to stand-alone. We don't have to provide all the data from the previous reports but we need to provide enough background, history, data summaries, etc. that this can be a stand-alone report.

2.2. Approach to Address Objective

- Evaluation of physical and chemical measurements to characterize dredging residuals
 - Use bathymetric, physical, chemical, and plume tracking results to characterize and quantify residuals.
- Evaluation of organisms to assess remedy effectiveness
 - Compare body burdens of organisms (invertebrates and fish) over space and time; look at changes in PCB patterns
 - Compare body burdens in H-D macroinvertebrates w/ sediment and water column concentrations (trends over space and time) and patterns.
 - Discuss trends in genotoxicity data (including fish size, wt. etc.) - probably not - depends what data evaluations are provided by EPA.
- Evaluation of biological surrogates in predicting remedy effectiveness by comparing calculated water concentrations to actual measured water concentrations and comparing contaminant trends in biological surrogate to those measured in co-located sediments and waters

3. METHODS

3.1. Study Design - Summarize (in table) what was done each year using updated planned vs. actual events. Includes: Pre-Dredging 2006, During Dredging 2007, Post-Dredging 2008 through 2011.

Will acknowledge ancillary data collected but not part of this report (i.e., non-Battelle funded; Genotox, LIST, others?).

3.2. Data Collection Methods - brief discussion of how each type of sample was collected and any differences in methods from year to year. Discuss if locations changed at all between years. Summary with references to other reports. (Raw data will likely be presented electronically on disks, though format and content are yet to be decided; will be determined based on available quantity and format of data and available budget).

- Bathymetry
 - Plume tracking
 - Bathymetry
 - OBS
 - ADCP
 - Multi-depth water sampler (turbidity, chemistry, data)
 - LIST particle size results (sand/silt/clay or adhesive fraction)

- Sediment
 - Deep cores
 - Surface sediments associated with HD and SPMD/SPME deployments
- Water Column Grabs - samples associated with HD and SMPD/SPME deployments
- SPMDs
 - Sediment SPMDs
 - Water SPMDs
- SPMEs
 - Sediment SPMEs
 - Water SPMEs
- Hester Dendy Invertebrates Deployment
 - Body burden
 - Ecology
- Caged fish (catfish)
- Bivalves (clams)
- Indigenous fish
- Toxicity testing - pre-dredge only
- Genotoxicity - need info from ORD

3.3. Chemical and Physical Analytical Methods

- Physical Methods
- Organics (PCBs and PAHs)

3.4. Data Evaluation and Data Management

- Non-detect data - note how NDs were handled in summing for totals and statistics. Suggest using 1/2 MDL for all NDs for individual compounds.
- Total PAHs - 16 priority pollutants + alkylated PAHs = a total of 34 PAHs; if 34 PAHs are available for all samples and matrices, they will be used for evaluations; if not, total PAHs based on sum of 16 PAHs will be used.
- Statistics - describe statistical analyses used in report.
- QC review - describe QC protocols; all data in database; maintained daily; direct query outputs - reference QAPPs.

4. RESULTS

Add or update figures from previous reports and cross reference other reports - list by methods rather than measurements.

4.1. Bathymetry

- Evaluate 2011 bathymetry against previous results (pre, during, and post).

- Update some of the bathymetry cross-section figures in the dredge residuals 2010 report to show current surface relative to pre- and post-dredge 2007 surfaces.
- Compare any and all dates that are required to show differences in deposition/scour and calculating rate - calculate rates on an annual basis and a post- dredge-to-2011 basis.

4.2. Plume Tracking During Dredging

- Fixed sensors - optical back scatter (OBS)
 - Upstream, downstream: Plots of turbidity over time at permanent locations to show plume not reaching edge of dredge/study area during dredging (will need to include figure with area dredged during period of time of OBS data plots; no data from the dredging platform)
 - Turbidity from OBS sensors and total suspended solids (TSS) from co-located water MDWS samples and background data from fixed moorings (essentially background data)
 - OBS/Turbidity/TSS data correlation plots w/ R^2 values
- Acoustic Doppler Current Profiling (ADCP) - boat mounted; concurrent w/ MDWS. Battelle to be provided current data
- Multi-Depth Water Sampler (MDWS) - 2-D and 3-D plots of turbidity (from OBS with MDWS), TSS, PCB, and TOC results
 - Conductivity, temperature, depth (CTD), and turbidity sensors
 - CTD + data tables in Appendices if needed
 - OBS turbidity/suspended solids
 - Data from MDS
 - Water sample collection for turbidity and TSS
 - Correlations/comparability between similar measures (i.e., turbidity by OBS and lab TSS samples)
 - Water sample collection for PCBs (dissolved and particulate phases)
 - Document and plot (2-D and/or 3-D, if possible) total PCB concentrations in the water column by depth, location, and over time for the dredging/sampling events.
 - Calculate the dissolved vs. particulate total PCB concentrations, and see if they vary by depth and with the overall total PCB concentrations.
 - Compare PCB compositions (e.g., homologues) between dissolved and particulate phases of PCBs using stacked bar charts, and see if it changes with the overall total PCB concentrations (in the water column and of the material being dredged, if such information is available).
 - Attempt to correlate PCB and TSS data (maybe in conjunction with LIST data if collected at the same times) to allow for characterization of PCBs in the plume (using TSS/turbidity as a surrogate for PCBs for contaminant plume

tracking - if correlation observed). Attempt to calculate (Sea Engineering) total PCB mass in the water column during dredging assuming a reasonable TSS-PCB correlation is determined and PCB mass modeling can be produced.

- Due to lack of dredge position data, correlation of PCBs in water column with residuals will be limited to total PCB water column data vs, average sediment core data (assuming all is being "mixed" during dredging).
- Conduct a PCB composition comparison using homologue and/or congener data for: 1) PCBs in the water column, 2) the PCB residuals on the surface of the sediment post-dredging, and, 3) the PCBs in the sediments that were dredged (e.g., the average or most contaminated pre-dredging sediment core data, assuming it is "mixed" during dredging). This may include PCA analysis if notable compositional differences are observed.
- LIST Collection
 - Provide tables of results in Appendices.
 - Compare discrete sample lab TSS measurements and OBS to LIST measurements.
 - Reports from Sea Engineering include some interpretation; is this adequate?
- Plume Tracking Summary Information
 - Plume Tracking
 - Correlations of all methods to TSS
 - Methods and metrics for identifying plume
 - Mass of plume extension during identifiable dredging events (2-D and 3-D)
 - Resuspended Sediment Mass
 - Water column sediment flux calculations
 - Estimates of generation of TSS by dredge at
 - Multiple time periods
 - As a grand total during the entire dredging activity
 - Comparison with analytical methods
 - Estimates of residual solids mass generated due to resuspension
 - Link to Contaminant Distributions (Option)
 - Estimates of generation of PCBs by dredge
 - At multiple time periods
 - As a grand total during ht entire dredging activity
 - Comparison with analytical methods
 - Estimate of residuals solids mass (dissolved and particulate) of PCBs generated from resuspension (this will only work if PCBs

measured in water column correlate with TSS and can use sensor turbidity measurements as a surrogate)

4.3. Sediment Cores

- Sediment core characterizations - review results of 'Residual Report'; add 2011 core data to report and discuss long-term trends observed; add surface samples from 2011 cores to PCA analyses (for PCBs - need to decide if there's any value in looking at PAH distribution) performed in Residuals Report. Review and summarize core logs. Include core log data in Appendices and reference in report.

4.4. H-D Macroinvertebrates - average SA and FD data for each station. Data used in graphics and statistics will be normalized results.

- Maps showing H-D and associated sediment and water and nearest SPMD stations. Plot all biological samples on one map.
- Summary tables showing raw and lipid normalized tissue data (total PCBs and total PAHs [16 and 34]) and raw and TOC normalized sediment data (total PCBs and total PAHs [16 and 34]) as well as ancillary sediment data (TOC and PSD)
- Total PCBs in macro and co-located sediment and water - over space - separate bar charts
- Total PCBs in macro and co-located sediment and water - over time - separate line charts
- Total PCBs in co-located sediment vs. macro and water vs. macro - scatter plots - calculate correlation coefficients
- Total PAHs (either 16 or 34) in macro and co-located sediment and water - over space - separate bar charts
- Total PAHs in macro and co-located sediment and water - over time - separate line charts
- ANOVA on total PCBs in macro and co-located sediment and water - temporal and spatial
- ANOVA on total PAHs in macro and co-located sediment and water - temporal and spatial
- PCB homologues in macro and co-located sediment and water - over space - stacked bar charts
- PCB homologues in macro and co-located sediment and water - over time - only if we can isolate one or two homologues that look like they are showing significant changes over time based on ANOVA.
- PCB congeners in macro and co-located sediment and water - PCA analysis (Option)

4.5. Indigenous Fish

- Brown Bullhead Catfish
 - Map of fish samples for each year (Ashtabula River and Reference [Conneaut Creek]) - if GPS coordinates available; Reference available for 2011 only
 - Lipid-normalized fish data; should we do all graphing and stats on non-normalized, normalized or both?
 - Total PCBs in fish (Ashtabula River and Reference) - over space - bar charts
 - Total PCBs in fish (Ashtabula River and Reference) - over time - line charts
 - Total PAHs in fish (Ashtabula River and Reference) - over space - bar charts
 - Total PAHs in fish (Ashtabula River and Reference) - over time - line charts
 - ANOVA - total PCBs in fish (Ashtabula River and Reference)
 - ANOVA - total PCBs in fish - temporal comparison
 - ANOVA - total PAHs in fish (Ashtabula River and Reference)
 - ANOVA - total PAHs in fish - temporal comparison
- Caged Catfish: confirm status of these analyses and what data are available - present in Section 3 - Methods only.

4.6. Bivalves - Clams: No data in Battelle database - will not discuss clams in this report

4.7. Biological Surrogates

4.7.1. SPMDs - Provide data as ng/g SPMD (assuming this information is available in the database - current concentrations are in ng/SPMD).

- Summary tables of :
 - Total PCBs and total PAHs both PRC corrected and PRC uncorrected (compare values to see if there is a bias -- maybe do a t-test on the two data sets?). From this comparison, determine which data set we will use to prepare graphics and statistics (will present to Joe S-B for discussion prior to making a decision)
 - Calculated water concentrations from water column SPMDs (will not calculate porewater concentrations for sediment SPMDs) - PRC corrected only?
 - Map of SPMD locations for each year (2006, 2008, and 2011)
- ##### 4.7.1.1. Sediment SPMDs
- Total PCBs in sediment SPMDs - over space - bar charts
 - Total PCBs in sediment SPMDs - over time - line charts
 - Total PAHs in sediment SPMDs - over space - bar charts
 - Total PAHs in sediment SPMDs - over time - line charts
 - ANOVA on total PCBs in sediment SPMDs - temporal and spatial
 - ANOVA on total PCBs in sediment SPMDs vs. co-located sediment - temporal and spatial

- ANOVA on total PAHs in sediment SPMDs - temporal and spatial
- ANOVA on Total PAHs in sediment SPMDs vs. co-located sediment - temporal and spatial
- PCB homologues in sediment SPMDs and co-located sediment - over space - stacked bar charts
- ANOVA on PCB homologs in sediment SPMDs vs. co-located sediment - temporal and spatial
- PCB homologues in sediment SPMDs and co-located sediment - over time - line chart - only if one or two homologues showed significant changes over time

4.7.1..2. Water SPMDs

- Total PCBs in water SPMDs - over space - bar charts
- Total PCBs in water SPMDs - over time - line charts
- Total PAHs in water SPMDs - over space - bar charts
- Total PAHs in water SPMDs - over time - line charts
- ANOVA on total PCBs in water SPMDs - temporal and spatial
- ANOVA on total PCBs in water SPMDs vs. associated water - temporal and spatial
- ANOVA on total PAHs in water SPMD - temporal and spatial
- ANOVA on total PAHs in water SPMD vs. associated water - temporal and spatial
- PCB homologues in water SPMDs and co-located water - over space - separate stacked bar charts
- ANOVA on PCB Homologs in water SPMDs vs. co-located water - temporal and spatial
- PCB homologues in water SPMDs and co-located water - over time - line charts - only if one or two homologues showed significant changes over time
- PCA on SPMDs sediment, SPMDs water, and co-located sediment and water for PCBs and PAHS (Option)
- Compare patterns of PCB congeners and PAHs in SPMDs and co-located sediments and water.

4.7.2. SPMEs - Provide concentrations based on ng/SPME or ng/SPME surface area if available.

- Map of SPME locations for each year (2006 and 2008)
- Analyses will only be conducted for 2008 data; discuss why in report. Data evaluation will be limited because of the small amount of data available.

4.7.2..1. Sediment SPMEs

- Total PCBs in 2008 sediment SPMEs and co-located sediment - over space - separate bar charts
- Total PAHs in sediment SPMEs - over space - bar charts
- PCB homologues in sediment SPMEs - over space - stacked bar charts
- ANOVA on total PCBs in sediment SPMEs - spatial
- ANOVA on total PCBs in sediment SPMEs vs. associated sediment - spatial

- ANOVA on total PAHs in sediment SPMEs -spatial
- ANOVA on total PAHs in sediment SPMEs vs. associated sediment - spatial
- PCB homologues in sediment SPMEs vs. associated sediment and water - over space - stacked bar charts

4.7.2..2. Water SPMEs

- Total PCBs in 2008 water SPMEs - over space - bar charts
- Total PCBs in associated water vs. water SPMEs - scatter plot - calculate correlation coefficients (ANOVA?)
- Total PAHs in water SPMEs - over space - bar charts
- Total PAHs in associated water vs. water SPMEs - scatter plot - calculate correlation coefficients (ANOVA?)
- PCB homologues in water SPMEs - over space - stacked bar charts
- ANOVA on total PCBs in water SPMEs -spatial
- ANOVA on total PCBs in water SPMEs vs. associated water -spatial
- ANOVA on total PAHs in water SPMEs - spatial
- ANOVA on total PAHs in water SPMEs vs. associated water -spatial
- PCB homologues in water SPMEs vs. associated sediment and water - over space - stacked bar charts
- SPMEs vs. SPMDs
- ANOVA comparing concentrations over space between the two methods in sediment and water?

4.8. Toxicity - Only have pre-dredge results. These were samples collected and analyzed for GLNPO - will make a decision on whether to include in this report.

4.9. Genotoxicity - DNA damage, sex, and age. Include catfish chemistry data. John Meier will provide write-up and associated data (Battelle will provide him with formatted data from database).

5. DISCUSSION

5.1. Evaluation of tools to assess remedy effectiveness

Overall questions to be answered: Did these methods effectively measure remedy effectiveness (with consideration for the scale of their application)? Were the tools useful and easily implemented? What type of data did they generate? Can the methods be applied at a different frequency to reduce costs? Should remedy effectiveness be more or less spatially measured? Provide insight into optimum spatial and temporal scales for the methods, at least for this site.

- Evaluation of physical and chemical measurements to characterize dredging residuals
 - Plot updated 2011 bathymetry against previous elevation data from Residuals report to look at accumulation over time.

- Compare physical and chemical characteristics of dredged residuals immediately post dredging to additional post-dredge surfaces.
- Evaluate *in-situ* plume tracking results. What do plume tracking results show without modeling? Can we estimate how much sediment was in the water column during dredging? Characterize the PCB congener data and grain size data in the residuals. Evaluate short-term resettlement vs. long-term settlement.
- Evaluation of organisms to assess remedy effectiveness
 - Do increases in macroinvertebrate body burdens correspond with increases in surface sediment concentrations or water column concentrations; compare totals over time and patterns among matrices.
 - Discuss trends in genotoxicity data (including fish size, wt., etc.).
- How effective are biological surrogates in predicting remedy effectiveness?
 - Qualitatively compare trends in concentrations over time and patterns among matrices (HDs, SPMDs, SPMEs, fish).
 - Compare results from SPMDs/SPMEs to sediment, water column, and tissue concentrations to evaluate how effective surrogate samplers are at estimating bioaccumulation and water concentrations.

5.2. Evaluation of the long-term remedy effectiveness - EPA to write this section

- Discuss long-term trends in physical and chemical concentrations in various media.
- Discuss changes in PCB composition over time and space and among various media (sediment, water, and tissue).
- Compare fish and SWACs for PCBs and PAHs.
- Discuss impacts to ecosystem health based on toxicity testing (only have pre-dredging data so might not want to include this at all); and on genotoxicity results (including fish length, wt., age, etc.).
- Discuss SWAC results if we have Neptune report?

6. SUMMARY, CONCLUSIONS, UNCERTAINTIES

7. REFERENCES

FIGURES

- See outline for types of figures.
- Error bars will be used when possible on all bar and line charts.

TABLES

- See outline for types of tables to be provided.

APPENDICES

- To be determined....

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2011 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Dredging Eval.

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

For CO Information and Use Only - See attachment titled "Ashtabula Riv. LOE and Cost History, 2-13-12.docx" for a breakdown of corrected approved LOE and cost for Base (Original), Amendment 1, and Amendment 2 Work Plan versions. The cumulative totals for all three versions are also shown.

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO

(Max 2)

☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

06/23/2011 To 06/22/2012

Cost/Fee: \$483,055.00

LOE:

This Action:

\$0.00

Total:

\$483,055.00

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

01/27/2012

Cost/Fee:

\$124,662.00

LOE: 730

Cumulative Approved:

Cost/Fee:

\$630,108.00

LOE: 4,025

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name

Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other ☒ Amendment Number:

000002

Contract Number

EP-W-09-024

Contract Period 06/23/2011 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Environmental

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☒

Work Assignment Amendment

☐

Incremental Funding

☐

Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

Corrected Work Plan Labor Hours for Base and Amendment 1

Base: LOE = 3066 hr; C/S = (b)(4) hr; Total Billable = 3140.25 hr

Amendment 1: LOE = 150.5 hr; C/S = (b)(4) hr; Total Billable = (b)(4) hr

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee:

LOE:

06/23/2011 To 06/22/2012

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

**STATEMENT-OF-WORK
FOR AMENDMENT 2**

CONTRACT NUMBER: EP-W-09-024

WORK ASSIGNMENT: 2-13

**TITLE: Joint U.S. EPA ORD/GLNPO Evaluation of Remedy Effectiveness and
Development of Site Delisting Lines-of-Evidence for the Ashtabula River
Environmental Dredging Project**

**PROJECT ADMINISTRATOR: U.S. Environmental Protection Agency
Office of Pollution Prevention and Toxic Substances
Washington, DC**

PROJECT CONTRACTOR: Battelle Memorial Institute, Columbus, OH

INTRODUCTION AND BACKGROUND:

As part of Amendment 1 to this work assignment, nine sediment core samples were collected in the North Slip of Jack's Marine along with 19 surface sediment samples. These samples were taken during the week of October 24, 2011 in an effort to determine if, as suggested by random Surface-Weighted Average Concentration (SWAC) sampling in July 2011, some polychlorinated biphenyl (PCB) hot spots in the North Slip of Jack's Marine survived the 2007 dredging of the Ashtabula River Area-of-Concern (AOC). The surface sediment samples were analyzed for PCB Aroclors and total organic carbon (TOC); the sediment core samples were archived for potential future examination and analysis. The results of the surface sediment analyses indicated numerous concentration values in excess of the 0.7-ppm (as Aroclors) maximum post-dredging goal established for any individual sampling point in the Ashtabula River AOC. These data further suggest the possibility of the existence of contaminated sediment still remaining within the North Slip of Jack's Marine.

To further explore the nature of the remaining sediment in the North Slip of Jack's Marine, the U.S. EPA Great Lakes National Program Office (GLNPO), one of the two primary Agency parties to this work assignment, desires to examine the physical characteristics of the nine deep sediment cores collected this past July in the North Slip. GLNPO also intends to analyze selected core segments derived via segmentation and homogenization of these cores for PCBs and other chemical and physical parameters.

The processing and physical characterization of said nine cores are the initial focus of Amendment 2 to the Statement-of-Work (SOW) for this work assignment. Following review of said characterization results and also after reviewing all data from this past summer's SWAC sampling, GLNPO in concert with the National Risk Management Research Laboratory (NRMRL) of the Agency's Office of Research and Development (ORD), the other primary Agency party to this project, will determine how many core segments will be analyzed and

which analytes will be measured on each segment. All tasks described in the next section will be approved, funded, and conducted under Amendment 2.

DESCRIPTION OF TASKS

Task 1. Development of Technical and Financial Work Plans

The Contractor shall prepare Technical and Financial Work Plans for carrying out the tasks described below. The Technical Work Plan shall address in detail all six tasks. The Financial Work Plan shall present cost and level-of-effort (LOE) breakdowns for each individual task (except for Tasks 2 and 3, which shall be estimated as one aggregate) and for all six tasks in total. The costs of Tasks 1-4 will be funded initially as a lump sum. Following review of the physical characterization data and information developed in Task 2, GLNPO/ORD will make a decision on how many of the core segments created in Task 3 to analyze and which analyses (Task 5) to conduct on them. The Contractor shall prepare the cost and LOE estimates for Tasks 5 and 6 assuming that: a) all 58 core segments potentially to be developed in Task 3 will be analyzed, and (b) the entire suite of analyses summarized in Task 5 will be conducted. If GLNPO/ORD decide to analyze fewer samples or conduct a less robust suite of analyses, the scope of this amendment will be appropriately adjusted via a Technical Directive. In this event, the Contractor will be requested to supply a revised cost estimate for Tasks 5 and 6. Funds for Tasks 5 and 6 will be awarded after a final decision on their scope is determined.

The Technical and Financial Work Plans shall be submitted to GLNPO/ORD within 2 weeks of the Contractor receiving a solicitation for proposals from the U.S. EPA Contract Officer. It is anticipated the U.S. EPA Contract Officer will notify the Contractor of Work Plans approval and deliver a Notice-to-Proceed within 2 weeks of receipt of the Contractor's Work Plans.

Note: No addenda or updates to the existing approved Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP) for this work assignment will be required to perform the supplemental work specified in this SOW amendment.

Task 2. Physical Characterization of Sediment Cores

The nine cores collected in July 2011 were photographed through their transparent plastic collection tubes after they were brought up out of the Ashtabula River onto the *Mudpuppy* boat deck. All pertinent information generated during the penetration and retrieval of the deep cores was documented in a log book. These photographic records and log book have been turned over to GLNPO/ORD.

For this amendment, GLNPO/ORD desire to again photograph the nine cores, this time after the collection tubes have been cut away and removed from around the collected sediment. Five of the nine cores were cut into two core segments in July 2011 for ease of shipping back to the Contractor's laboratories in Columbus, OH. The other four cores were short enough that they didn't need to be cut for shipping. Once the containing tubes have been removed from around the sediment cores, the Contractor shall reconstruct the five divided cores to their original profiles. The nine cores shall then be photographed with sufficient photographs being taken of

each reconstructed core (five cores) and each intact core (four cores) to clearly reveal sediment color, texture, and striations of the entire core length.

Once the nine cores have been photographed, a sediment boring log shall be prepared for each distinct core profile. This boring log shall include a description of sediment type and texture (silt/sand/clay/etc.), color, color changes, sheen, visible striations, odor, and any other defining physical characteristics. A sample sediment boring log is attached as Figure 1.

It is anticipated this task will require 2-3 days to complete following receipt of the Notice-to-Proceed from the U.S. EPA Contract Officer.

Task 3. Segmentation and Preparation of Sediment Cores for Future Chemical Analysis

Following the physical characterization steps in Task 3 above, the Contractor shall divide each core into appropriate segment lengths for subsequent chemical analysis. The top 6 in. of each core shall be removed and saved to enable nine additional surface sediment PCB concentrations to be determined to augment the surface sediment database developed from the July 2011 sampling event. Below the top 6 in., each core shall be divided in turn into nominal 1-ft segments through the remaining length of the core. If distinct layers in a core (e.g., silt layer overlaying sand layer) are observed, that portion of the core shall be segmented to keep these layers separate. The bottom segment of each core shall consist of whatever sediment is left over from the above segmentation process unless the remaining core length is less than 2 in. In this case, the small remaining remnant shall be combined with the 1-ft segment immediately above to yield a core segment slightly longer than 1 ft. The length of each core segment shall be recorded in a table to be included in the data package prepared in Task 4 below.

Core ID Nos., total core lengths, number and length of core segments for shipping, and number of anticipated core segments for chemical analysis are summarized in Table 1. As indicated, it is anticipated that a total of 58 core segments will be created based on the above segmentation plan. The core ID Nos. are tied to the location map shown in the pdf figure attached to Battelle Senior Research Scientist's Lisa Lefkovitz's e-mail memo sent to Richard Brenner on November 4, 2011 at 2:05 PM (not attachable to this docx document, but hereafter referred to as Figure 2).

Each core segment created above shall be homogenized and an appropriate mass/volume of sediment placed into appropriately-sized sample bottles for PCB Aroclor, PCB congener/homolog, polycyclic aromatic hydrocarbon (PAH), total organic carbon (TOC), diesel range organics/oil range organics (DRO/ORO), oil and grease, toxicity characteristic leaching procedure (TCLP), particle size distribution (PSD), and moisture content analyses. The remainder of the sediment segment samples along with the core tubes shall be disposed of according to accepted practices.

The sample bottles shall be archived at appropriate temperatures pending a decision on whether GLNPO/ORD decide to analyze all or a subset of the 58 core segments. This decision is expected to be made within several weeks of the receipt of the physical characterization data and records provided in Task 2 above. When the Government determines what fraction, if any, of

the archived samples will not be analyzed, those samples shall be disposed of by the Contractor using accepted practices.

It is anticipated this task will be conducted concurrently with Task 2 and will require an additional 1-2 days beyond completion of Task 2.

Task 4. Preparation of Core Characterization Deliverable

The Contractor shall organize and submit all essential information documented in Tasks 2 and 3. This information shall include a photographic record for each of the nine cores (Task 2), a sediment boring log for each core (Task 2), and a summary of chemical analysis segmentation data for each core (Task 3). This information packet shall be submitted to GLNPO/ORD within 2 weeks of the completion of Tasks 2 and 3, but under no circumstances no later than January 31, 2012 provided the Contractor receives a Notice-to-Proceed from the U.S. EPA Contract Officer by December 31, 2012.

Task 5. Chemical Analysis of Sediment Core Segments

The Contractor shall conduct the following suite of analyses on the projected 58 core segments that will be generated by the segmentation process in Task 3 (see Table 1).

- | | |
|--------------------------------------|---------------------|
| 1. PCB Aroclors | 5. DRO/ORO |
| 2. PCB Congeners/Homologs | 6. Oil and Grease |
| 3. PAHs (16 priority plus alkylated) | 7. PSD |
| 4. TOC | 8. Moisture Content |

In addition, the Contractor shall for each of the eight cores (excluding the duplicate core) conduct TCLP analyses on composites consisting of aliquots of each segment for that core. TCLP analyses shall be carried out with respect to metals and semivolatile compounds. For conducting PCB Aroclor, PCB congener/homolog, PAH, TOC, PSD, and moisture content analyses, the Contractor shall use methods approved in QAPP QAID 163-Q16-0 developed for Phases 2 and 3 on Task Order 50, Contract No. EP-C-05-057. For DRO/ORO, oil and grease, and TCLP, the Contractor shall specify in the Technical Work Plan for GLNPO Quality Assurance review the method(s) to be utilized. Utilization of accepted standard methods is encouraged.

All sediment core segment analyses shall be completed within 6 weeks following a decision by GLNPO/ORD on the number of segments to be analyzed and the analyses to be conducted.

All sediment core segment samples shall be held in archive status by the Contractor until all data are reviewed and accepted by GLNPO/ORD. As directed by the NRMRL Work Assignment Manager, archived samples shall then either be shipped to NRMRL-Cincinnati or disposed of properly.

Task 6. Preparation of Data Report

The Contractor within 2 weeks of completing all analyses designated by GLNPO/ORD and as listed in Task 5 above shall submit a comprehensive data report documenting all analytical results. All results shall be tied to the Core ID Nos. shown on the location map in Figure 2.

Figure 1. Sample Sediment Boring Log

CH2MHILL		SEDIMENT BORING LOG		SHEET 1 OF 1	
				STATION ID WH-SD076	
PROJECT: WAUKEGAN HARBOR RD INVESTIGATION		TOP OF DECK TO SED SURF: 13.1'			
PROJECT NO.: 350432.FI.01		TOP OF DECK TO WATER: 3.9'			
CONTRACTOR: Patrick Engineering		WATER DEPTH: 9.2'			
EQUIPMENT: Piston Sampler + Split Spoon		EASTING: 1122071.22436			
LOGGER: K. Davis		NORTHING: 2074535.38325			
DATE: 3/21/2007		START: 12:30		END: 13:40	
		SEDIMENT DEPTH TO TILL: 10.5'			
DEPTH BELOW SURFACE (FT)		SEDIMENT DESCRIPTION		COMMENTS	
PENETRATION (FT)		SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE		SAMPLE ID, Q/VOC, ETC	
RECOVERY (FT)					
SAMPLER TYPE					
1.4	1.4	PS1	0.0 - 0.4 fine gray fine silty silt 0.4 - 1.4 medium brown sand with fine silt lenses 1.4 - 1.8 light brown coarse sand with gravel 1.8 - 2.6 medium sand with coarse sand 2.6 - 6.6 coarse sand with traces of medium sand and gravel	WH-SD076-0.0/1.4 WH-SD076-0.4/1.4 WH-SD076-1.4/2.4 WH-SD076-2.4/3.4 WH-SD076-3.4/4.4 WH-SD076-4.4/5.4 WH-SD076-5.4/6.4 WH-SD076-6.4/7.4+MS/MSD WH-SD076-7.4/8.4 WH-SD076-8.4/9.4	
2.0	2.0	SS1			
6.4	6.4	PS2	6.5 - 10.0 medium sand, loose, with fine sand representative of lake sand from outer harbor		
2.0	2.0	SS2	10.0 - 10.5 fine sandy clay 10.5 - 11.8 medium gray clay till, dense and stiff, not plastic	WH-SD076-9.4/10.5	
		End of Boring: 11.8'			

**Table 1. Information on Sediment Cores Extracted from
the North Slip of Jack's Marine –
Week of October 24, 2011**

Core ID No.	Total Core Length (in.)	No. of Segments for Shipping	Length of Segment 1 (in.)	Length of Segment 2 (in.)	No. of Segments for Chemical Analysis
C-1	35	1			4
C-2	101	2	40.75	60	9
C-3	97	2	37	60	9
C-4	112	2	45.5	66.5	10
C-4FD*	104	2	46.75	57	9
C-5	10	1			2
C-6	15	1			2
C-7	48				5
C-8	90	<u>2</u>	49.75	40	<u>8</u>
Total		14			58

* FD = field duplicate

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2009 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Dredging Eval.

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee: \$0.00

LOE:

06/23/2009 To 06/22/2012

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor W/P Dated: 07/25/2011

Cost/Fee: \$481,149.00

LOE: 3,066

Cumulative Approved:

Cost/Fee: \$481,149.00

LOE: 3,066

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other☐ Amendment Number:

Contract Number

EP-W-09-02

Contract Period 06/23/2009 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Environmental

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:



Work Assignment



Work Assignment Close-Out



Work Assignment Amendment



Incremental Funding



Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

Work Assignment Initiation - A Technical and Financial Work Plan is required. There are 3,293 PLHs allocated for this Work Assignment.

☐ Superfund

Accounting and Appropriations Data



Non-Superfund

SFO
(Max 2)

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

06/23/2009 To 06/22/2012

Cost/Fee:

LOE:

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated

Cost/Fee:

LOE:

Cumulative Approved

Cost/Fee:

LOE:

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number 202-564-2182

FAX Number:

(Signature)

(Date)

STATEMENT-OF-WORK

CONTRACT NUMBER: EP-W-09-024

WORK ASSIGNMENT: 2-13 (Performance Based)

TITLE: Joint U.S. EPA ORD/GLNPO Evaluation of Remedy Effectiveness and Development of Site Delisting Lines-of-Evidence for the Ashtabula River Environmental Dredging Project

PROJECT ADMINISTRATOR: U.S. Environmental Protection Agency
Office of Pollution Prevention and Toxic Substances
Washington, DC

PROJECT CONTRACTOR: Battelle Memorial Institute, Columbus, OH

INTRODUCTION AND BACKGROUND

An interdisciplinary and collaborative research project to develop evaluation tools and methods for environmental dredging was initiated in March 2006 between the Cincinnati-based National Risk Management Research Laboratory (NRMRL) and National Exposure Research Laboratory (NERL) of the U.S. Environmental Protection Agency's (U.S. EPA's) Office of Research and Development (ORD), hereafter collectively referred to as ORD, and U.S. EPA's Chicago-based Great Lakes National Program Office (GLNPO). GLNPO, through the Great Lakes Legacy Act (GLLA), is charged with undertaking and overseeing the remediation of contaminated sediments in the Great Lakes Areas of Concern (AOCs). ORD, through its research mission is directed to evaluate the application and efficacy of contaminated sediment remediation technologies, such as environmental dredging. Based on these mutual interests, the two U.S. EPA organizations formed a partnership to comprehensively monitor and assess progress on the Ashtabula River Environmental Dredging Project in Ashtabula, OH. Dredging was selected by GLNPO as the remedy-of-choice for the Ashtabula River to remove sediment contaminated with polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), toxic metals, pesticides, and radionuclides. The primary chemical-of-concern (COC) for this site, however, is PCBs.

Under this partnership, a series of environmental measurements were conducted on the Ashtabula River beginning in the fall of 2006 to support the development of measures of remedy effectiveness. These measurements were made to evaluate the efficacy of environmental dredging in removing a large quantity of sediment contaminated with PCBs. Samples of sediment and overlying water were collected and analyzed before (Phase 1), during (Phase 2), and after (Phase 3) dredging. In addition, measurements were made to characterize the river's ecosystem also before (Phase 1), during (Phase 2), and after (Phase 3) dredging to determine the impact that dredging had on the ecosystem. Bathymetry measurements before (Phase 1) and after (Phase 3) dredging using multi-beam and side-scan sonar were also carried out.

Phase 1 activities were conducted on Work Assignment (WA) 2-11 under OPPTS (Office of Pollution Prevention and Toxic Substances) Contract EP-W-04-021 administered by the U.S. EPA Headquarters Procurement Operations Division (HPOD). Phases 2 and 3 work was performed on Task Order (TO) 50 under NRMRL Contract EP-C-05-057 administered by the U.S. EPA Cincinnati Procurement Operations Division (CPOD). Follow-up field studies in the summer of 2009 to determine river, sediment, and ecosystem conditions 2 years after the completion of dredging were also carried out on TO 50. A report evaluating and quantifying dredge residuals and dredge removal efficiency was published by NRMRL in September 2010. A second report summarizing results of immediate and long-term (2-year) effects of dredging operations on ecosystem health and restoration using biological indicator, food web, and surrogate sample data is currently being prepared under NRMRL and will be published later this year.

SITE DESCRIPTION

The Ashtabula River lies in extreme northeast Ohio, flowing into Lake Erie's central basin at the City of Ashtabula. Its drainage basin covers an area of 137 sq mi, with 8.9 sq mi in western Pennsylvania. Major tributaries include Fields Brook, Hubbard Run, and Ashtabula Creek. The City of Ashtabula, with an estimated population of approximately 21,000 (Year 2000 census), is the only significant urban center in the watershed, with the rest of the drainage basin being predominantly rural and agricultural. Concentrated industrial development exists around Fields Brook (east of the Ashtabula River) and east of the Ashtabula River mouth. Sediments in portions of the Ashtabula River are contaminated with a variety of chemicals, including PCBs.

The PCBs were thought to have originated primarily from Fields Brook, a stream that drains into the Ashtabula River in the area of the Upper Turning Basin. Fields Brook and its five tributary streams that drain a 5.6-sq mi watershed have been identified as the primary source of contamination to the Ashtabula River. Up to 20 separate industrial manufacturing activities, ranging from metal fabrication to chemical production, have occurred in the area since the early 1940s. The decades of manufacturing activity and waste management practices at industrial facilities resulted in the discharge or release of a variety of hazardous substances to Fields Brook and its watershed.

Sediments at the Fields Brook site were contaminated with PCBs, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), heavy metals, phthalates, and low level radionuclides. VOCs and heavy metals including mercury, lead, zinc, and cadmium have been detected in surface water from Fields Brook and its Detrex tributary. Contaminants detected in fish include VOCs and PCBs. The site has posed a potential health risk to individuals who ingested or came into direct contact with contaminated water from Fields Brook and with contaminated fish or sediments.

Fields Brook has been eliminated as a source of contamination (or recontamination) of the Ashtabula River. A Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanup of Fields Brook was completed in 2003. Subsequently, a post-cleanup monitoring program was put in place to protect against recontamination of Fields Brook as well as the Ashtabula River.

PREVIOUS STUDIES AND ACTIVITIES

Approximately 600,000 cu yd of contaminated sediments were initially targeted for removal in the Upper Turning basin and between the Upper Turning Basin at the mouth of Fields Brook and the 5th Street Bridge. The COCs in this stretch of the river included PCBs; PAHs; hexachlorobenzene; hexachlorobutadiene; metals; and the radionuclides uranium, radium, and thorium. The radionuclide concentrations were above background levels but below regulatory criteria.

Environmental dredging was carried out this 1.2 mile long reach of the Ashtabula River beginning in the fall of 2006 and ending in the fall of 2007. Dredging was not performed during the 2006/2007 winter. Extensive pre-dredging characterization efforts were undertaken in the summer of 2006 (Phase 1). Numerous sediment resuspension, sediment mapping (bathymetry), and ecological measurements were made during the dredging process in 2007 (Phase 2). Post-dredging characterization of sediment residuals was conducted in the fall and early winter of 2007 (Phase 3). Particular emphasis was given in Phase 3 to measuring the quantity and composition of sediment residuals and the fraction of contaminated sediment removed by the dredging operation, i.e., estimating dredge removal efficiency. Follow-on studies were implemented in 2008 and 2010 to evaluate the degree of recovery achieved in indigenous food web species 1 year and 3 years, respectively, after dredging. To assist in defining river bottom (i.e., sediment surface) topography before and after dredging, multi-beam and side-scan bathymetry measurements were also conducted.

In Phase 1 of this dredge residuals research project, GLNPO, under its GLLA mandate, conducted a baseline characterization of the river that included all of the above COCs, while ORD focused only on the PCBs in selected areas of the river. In Phases 2 and 3, ORD continued to focus on only the PCB inventory in the study area and selected areas of the river where biological collections and surrogate deployments were made.

RATIONALE FOR THIS PROJECT

Additional sampling is planned for the summer and fall of 2011 to satisfy both ORD and GLNPO objectives. ORD desires to continue its long-term evaluation of both sediment and associated ecosystem characteristics for the purpose of determining remedy effectiveness. This year's sampling and analytical efforts will permit the development of a snapshot portrayal of physical, chemical, and biological conditions 4 years after the completion of dredging in late 2007. Sediment surface and core samples will determine the rate and extent that new (hopefully clean) sediment is being deposited on top of the original residual sediment layer and whether newly deposited sediment is intermixing with the original residual sediment layer or forming its own discrete layer. Analysis of sediment PCB concentrations as a function of depth will assist in evaluating the impact of sediment layer intermixing, if any, on the PCB profile of the original residual layer. PCB and PAH measurements on fish and macroinvertebrate tissue and semipermeable membrane (SPMD) fibers will allow comparison of these parameters with comparable measurements made immediately before the start (2006) and immediately after the completion (2008) of dredging and again in 2010. The entire 2011 program will enable preparation of a report assessing the long-term recovery (remedy effectiveness) of both sediment

and ecosystem environments at this site resulting from the removal of contaminated sediment via environmental dredging.

GLNPO in implementing provisions of a bilateral agreement between the United States and Canada has an ultimate goal of eventually closing and delisting each Area-of-Concern (AOC) where remedial activities are conducted under its GLLA mandate. For this site, the bilateral agreement AOC stretches X miles from the 24th Street bridge on the south to the mouth of the Ashtabula River on the north, whereas the GLLA AOC is only concerned with the 1.2-mile reach from the Upper Turning Basin on the south to the 5th Street bridge on the north (Figure 2). The shorter GLLA AOC is encompassed within the longer bilateral agreement AOC.

Closure and delisting can require varying degrees of time passage and follow-up testing, depending on site characteristics and the remedial process(es) applied. For the Ashtabula River site, GLNPO has made a decision 4 years after dredging completion to develop necessary lines of evidence this summer to facilitate consideration and discussion of potential closure and delisting of the entire bilateral agreement AOC. Toward this end, 100 sampling points selected at random within the bilateral agreement AOC footprint will be sampled and analyzed for PCBs and PAHs and specified metals, pesticides, and radionuclides. AOC surface-weighted average concentrations (SWACs) of these contaminants in the top 6 in. of the surface sediment layer will be developed based on these measurements and used by GLNPO in these deliberations.

This project will address the above needs and provide an evaluation of the ability of environmental dredging, coupled with source control, to restore over an extended period (4 years) a highly contaminated river and its associated food web and ecosystem to productive use and activity.

OBJECTIVES

The objectives of this project are twofold:

1. Conduct a comprehensive set of physical, chemical, and biological measurements and analyses to enable ORD to compare residual sediment and ecosystem characteristics 4 years after the completion of dredging on the Ashtabula River to those same characteristics measured immediately before and immediately after dredging, i.e., to evaluate the long-term remedy effectiveness of environmental dredging in restoring a highly contaminated river ecosystem.
2. Conduct sufficient measurements and analyses to enable GLNPO to assess current surface sediment characteristics for the Ashtabula River site and provide lines of evidence useful in AOC delisting determinations.

DESCRIPTION OF TASKS

The above objectives will be addressed and carried out on this project during Option Period of Contract No. EP-W-09-024. Option Period 2 begins June 23, 2011 and ends June 22, 2012. All

field measurements, sample collection activities, samples analyses, data reduction and interpretation, and reporting requirements will be initiated and completed during this 1-year period. The tasks described below detail the necessary work and reporting elements for this work assignment.

Task 1. Development of Technical and Financial Work Plans

The Contractor shall develop a synoptic Technical Work Plan and a detailed Financial Work Plan for carrying out WA 2-13. A number of the tasks involved in this work assignment were conducted in similar fashion in Phase 1 of this project on WA 1-11 under Contract No. EP-W-04-021 and in Phases 2 and 3 on TO 50 under NRMRL Contract No. EP-C-05-057. The Technical Work Plan for this work assignment can mimic, where appropriate, most of the features of the Ashtabula River Phase 1 and Phases 2/3 Work Plans prepared and implemented by subject contractor. The Financial Work Plan shall present cost breakdowns for each individual task.

The Contractor shall prepare a draft Technical Work Plan and a draft Financial Work Plan for ORD/GLNPO review within 2 weeks of receiving the Notice to Proceed. ORD/GLNPO will review the draft Work Plans, request changes as needed, and approve within 1 additional week.

Task 2. Preparation of Addendum to Existing QAPP

A comprehensive Quality Assurance Project Plan (QAID No. 163-Q16-0) was prepared by the Contractor for Phases 2 and 3 on TO 50 under NRMRL Contract No. EP-C-05-057. It was endorsed by the U.S. EPA Quality Assurance Manager for the Land Remediation and Pollution Control Division on May 10, 2007. This QAPP is applicable in its entirety to the conduct of those tasks on this work assignment that duplicate or are similar to tasks conducted on Phases 2 and 3. As such, this QAPP is incorporated in WA 2-13 by reference. However, several tasks for this work assignment are new and were not covered in QAID No. 163-Q16-0. The Contractor shall, therefore, prepare an Addendum to QAID No. 163-Q16-0 updating and/or revising, as necessary:

1. Subsection 3.2 (Sampling Strategy) under Section 3.0 (Experimental Approach) to include the strategy and SOP (see Tasks 6 and 7) for collecting 100 so-called "Surface Weighted Average Concentration" (SWAC) samples and splitting sample volumes for distribution to identified analytical laboratories (see Task 6),
2. Subsection 4.4.3.3 (Collection of Surficial Sediment) under Section 4.0 (Sampling Procedures) to define methods and equipment that will be utilized to collect the 100 SWAC samples (see Task 6),
3. Subsection 5.1.1 (Chemical Analysis of Sediment Samples) under section 5.0 (Testing and Measurement Protocols) to include the SOP for analyzing the SWAC samples for specified radionuclides (see Task 7),

4. Subsection Subsection 6.4.2 (Analytical Laboratory) under Section 6.0 (QA/QC Checks) to identify QA checks and procedures for laboratory QC samples for the specified radionuclides (see Task 7), and
5. Subsection 7.3 (Data Reduction Procedures) under Section 7.0 (Data Reporting, Data Reduction, and Data Validation) to describe data handling and formatting procedures for the specified radionuclides preparatory to transmitting said data package to the ORD contractor that will be preparing the data report for the SWAC sampling.

The Contractor shall prepare a draft QAPP Addendum for ORD/GLNPO review within 1 week of receiving the Notice to Proceed. ORD/GLNPO will review the draft Addendum, request changes as needed, and approve within 2 additional weeks.

Note to Contractor: The Health and Safety Plan (HASP) prepared by the Contractor for TO 50 under NRMRL Contract EP-C-05-057 has been approved by the U.S. EPA NRMRL Health and Safety Officer for continuing use on the Ottawa River project through 2014. Therefore, no supplements or modifications to the existing HASP are required under this work assignment.

Task 3. Receipt and Analysis of Fish Tissue Samples

During May 2011, ORD in concert with the U.S. Fish and Wildlife Service (USFWS) and the Ohio Environmental Protection Agency (OEPA) caught 20 brown bullhead individual fish (10 from the Ashtabula River and 10 from the Conneaut River [reference site]) and six small short-lived adult fish (composite samples - three from the Ashtabula River and three from the Conneaut River). USFWS took custody of these fish following their capture. They have necropsied and homogenated the bullheads and performed certain analyses on them. ORD has frozen the small short-lived adult fish. Following approval of the Contractor's Work Plans for this project, USFWS will send a portion of the 20 frozen brown bullhead homogenates to the Contractor for analysis and ORD will send the carcasses of all six frozen small short-lived adult fish composite samples to the Contractor for analysis.

ORD and/or USFWS will conduct no analyses on the small short-lived adult fish. ORD will send whole fish carcasses to the Contractor for this fish species. The Contractor shall homogenize and conduct the following suite of analyses on each of the six composite small short-lived adult fish samples using methods approved in QAPP QAID No. 163-Q16-0 developed for Phases 2 and 3 on TO 50:

- | | |
|--|--------------------------------------|
| 1. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 2. PCB Homologs | 5. Wet Weight |
| 3. PCB Aroclors (20% of samples = 2 samples) | 6. Lipids |

USFWS will conduct PCB congener and homolog, wet weight, and lipid analyses on the 20 brown bullhead homogenates. Therefore, the analyses conducted by the Contractor on the 20 brown bullhead fractional homogenates it receives from USFWS shall be limited to the following three analytes, again using methods approved in QAPP QAID No. 163-Q16-0.

1. PAHs (16 priority plus alkylated)
2. PCB Aroclors (20% of samples = 4 samples)
3. Wet Weight

All fish tissue analyses shall be completed within 2 months following receipt of the fish tissue samples (completion anticipated to be by September 30, 2011).

All fish tissue homogenate samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task 4. Provision of Support for Collection of Sediment Core Samples

In similar fashion to the manner in which and the exact locations where deep (full depth profile) sediment core samples were collected in Phase 1 before dredging in 2006 and in Phase 3 immediately after dredging in 2007, residual sediment cores will again be collected in the summer of 2011. These samples will be collected to characterize 4-year post-dredging sediment inventory and chemical composition for comparison with earlier core characteristics. The U.S. EPA Mudpuppy boat, stationed at the Agency's Duluth, MN research laboratory, will be utilized to collect subject cores. This boat is outfitted with a vibra-core sampler and an A-frame and appurtenant equipment necessary to support the sample collection effort. Sediment cores ranging in length from 1 - 6 ft are anticipated. U.S. EPA will provide the personnel required to pilot the Mudpuppy, operate the vibra-core sampler, and handle and cap the core tubes as they are brought up to the boat platform. U.S. EPA will also provide all necessary nominal 4-in. diameter core tubes and caps.

A total of 30 full-depth primary cores and three full-depth duplicate cores shall be collected by the Mudpuppy at the same 30 sampling locations established by the Contractor for Phases 1 and 3. ORD will specify which three points are to be duplicate sampled. The Contractor shall provide the Mudpuppy captain with the lat/long coordinates for the 30 sampling points. All 30 sampling points lie within a 1,100-ft long footprint just north of the Upper Turning Basin between Transect 181+00 on the south and Transect 170+00 on the north.

The Mudpuppy captain will utilize the boat's on-board GPS system to locate the vibra-core sampler approximately over each sampling point. This GPS system, however, is not sufficiently accurate to precisely locate the vibra-core sampler over the target points. Accordingly, the Contractor shall provide a more-accurate GPS system capable of matching specified coordinates in the x-y (horizontal) plane within ± 10 cm and in the z (vertical) plane within ± 5 cm. A Contractor staff person shall operate this GPS system on the Mudpuppy's platform to assist the captain in precisely locating the boat over each sampling point once the captain has positioned the boat close to the point. This Contractor staff person shall also record time of collection, water depth, and sediment penetration depth for each point.

Once collected and capped, the Mudpuppy staff will store the core sample tubes on board until the end of that day. At that time, the Mudpuppy staff will hand off all cores collected that day to Contractor staff who will be working in the area on other tasks. If more frequent unloading is needed or preferred, the Mudpuppy captain will advise the Contractor to bring their boat alongside to receive core samples throughout the day as necessary and ferry them to shore. Once

unloaded, either throughout the day or at the end of the day, the Contractor shall assume custody of subject cores and the Mudpuppy's responsibility for those cores will end.

The Mudpuppy is scheduled to begin collecting residual core samples on July 25, 2011. It is anticipated 3 days will be required to collect all 33 core samples. A 4th day or even 4th and 5th days could become necessary due to weather and/or river conditions. Neither are expected in late July. It is assumed only one Contractor staff will be needed to support this task. Said staff person should be available to assist other Contractor personnel in offloading and storing the 33 cores.

Once all 33 cores have been collected and properly stored on a refrigerated truck, it is ORD's strong preference they be transported directly from the site to the Contractor's laboratory (presumably Duxbury, MA) where the core sample analyses will be conducted, rather than to Contractor Headquarters in Columbus, OH and then transported to the analytical laboratory later.

Task 5. Analysis of Sediment Core Samples

Once delivered to the Contractor's analytical laboratory, a core segmentation plan shall be developed for the 33 cores collected. The cores shall be cut apart and examined for general appearance, striation, color, and texture. The segmentation plan shall begin with an attempt to identify the core elevations that correspond to the dredging depth implemented in 2006. To the degree possible, the plan shall correlate 4-year post dredging core elevations with relevant elevations identified on 2006 pre-dredging and 2007 post-dredging cores. Beginning at the identified or assumed interface elevations and segmenting in 6-in. increments in both directions from the interface (similar to the plan implemented by the Contractor on residual sediment cores for the Ottawa River for WA 1-11 on this contract), it is estimated a total of five segments per core or 165 total cores will be identified needing analysis to properly characterize core contaminant profiles.

The Contractor shall conduct the following suite of analyses on the projected 165 core segment samples resulting from the above segmentation plan using methods approved in QAPP QAID 163-Q16-0 developed for Phases 2 and 3 on TO 50:

- | | |
|---|-------------------------------------|
| 1. PCB Individual Congeners | 5. TOC (Total Organic Carbon) |
| 2. PCB Homologs | 6. Moisture Content |
| 3. PCB Aroclors (20% of samples = 33 samples) | 7. PSD (Particle Size Distribution) |
| 4. PAHs (16 priority plus alkylated) | |

All sediment core segment sample analyses shall be completed within 2 months following completion of the above-described core segmentation process (completion anticipated to be by October 31, 2011).

All sediment core segment samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task 6. Collection of SWAC Surface Sediment Samples

In partial fulfillment of Objective 2, the Contractor shall collect 100 surface sediment samples to facilitate calculation of surface-weighted average concentrations for analytes that will be considered and utilized in site delisting deliberations. The locations of the 100 randomized sampling points will be determined by an ORD QA contractor in a statistically-designed sampling plan. The 100 points will be situated within the bilateral agreement AOC (larger area) and not confined just to the GLLA AOC (smaller area). The ORD QA contractor will provide the Contractor with a grid map of the sampling locations complete with lat-long coordinates.

The Contractor shall provide the necessary boat(s), personnel, sampling equipment, and sampling supplies to conduct this task. The Contractor shall also provide a GPS system (separate from the one provided for use on the Mudpuppy) capable of matching specified coordinates in the x-y (horizontal) plane within ± 10 cm and in the z (vertical) plane within ± 5 cm. Core samplers, rather than ponar samplers, shall be utilized to collect the surface sediment samples. Samples of approximately 12 in. depth shall be collected. The top 6 in. of each sample shall be retained and containerized for each location. The remainder of each sample shall be discarded. Sufficient sample shall be collected to enable all analyses identified in Task 7 to be carried out. If more than one sample is needed at each location to satisfy analytical mass requirements, an additional sample(s) shall be taken and composited with the other sample(s) from that site and then homogenized before dividing and distributing the samples to the several laboratories.

The Contractor shall conduct this sampling task concurrently with the collection of deep core samples with the Mudpuppy in Task 4 on or about July 25-29, 2011. This coordination effort should maximize efficiency of Contractor personnel utilization. For example, Contractor staff assigned to SWAC sampling can also be diverted temporarily to offload and take custody of the deep core samples collected by the Mudpuppy, whether once at day's end or periodically throughout the day if needed.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with SWAC sampling and other tasks as needed.

Task 7. Distribution and Analysis of SWAC Surface Sediment Samples

Each of the 100 SWAC samples shall be homogenized in the Contractor's laboratory. This may entail homogenizing only one 6-in. core or multiple 6-in. cores from the different sampling stations depending on the amount of sample the Contractor deems necessary to satisfy all analytical requirements designated for that station. The following table itemizes the number and types of analyses to be conducted on the SWAC samples. The three performing laboratories are also shown. For those analytes where only a subset (20 or 25 samples) of the 100 SWAC samples is to be analyzed, the Contractor shall prepare a random-generated analytical plan to identify the analyses to be conducted at each sampling station. All analytes that will not be conducted for all 100 sampling stations shall be conducted on the same 25 (or 20) random-generated sample subset.

<u>Analyte</u>	<u>No. Samples</u>	<u>Performing Laboratory</u>
1. PCB Aroclors	100	EPA CLP Laboratory
2. TOC	100	Battelle
3. PSD	100	Battelle
<u>Radionuclides (4 - 11)</u>		
4. Radium 226	25	Battelle
5. Radium 228	25	Battelle
6. Thorium 228	25	Battelle
7. Thorium 230	25	Battelle
8. Thorium 232	25	Battelle
9. Uranium 233/234	25	Battelle
10. Uranium 235	25	Battelle
11. Uranium 238	25	Battelle
12. PAHs (16 priority plus alkylated)	25	OEPA
<u>Metals (13 - 25)</u>		
13. Aluminum (Al)	25	OEPA
14. Barium (Ba)	25	OEPA
15. Calcium (Ca)	25	OEPA
16. Iron (Fe)	25	OEPA
17. Magnesium (Mg)	25	OEPA
18. Manganese (Mn)	25	OEPA
19. Mercury (Hg)	25	OEPA
20. Potassium (K)	25	OEPA
21. Sodium (Na)	25	OEPA
22. Strontium (Sr)	25	OEPA
23. Titanium (Ti)	25	OEPA
24. Vanadium (V)	25	OEPA
25. Zinc (Zn)	25	OEPA
<u>Pesticides (26 - 45)</u>		
26. Aldrin	25	OEPA
27. a-BHC	25	OEPA
28. b-BHC	25	OEPA
29. y-BHC	25	OEPA
30. d-BHC	25	OEPA
31. 4,4'-DDD	25	OEPA
32. 4,4'-DDE	25	OEPA
33. 4,4'-DDT	25	OEPA
34. Dieldrin	25	OEPA
35. Endosulfan I	25	OEPA
36. Endosulfan II	25	OEPA
37. Endosulfan Sulfate	25	OEPA
38. Endrin	25	OEPA
39. Endrin Aldehyde	25	OEPA

Analyte	No. Samples	Performing Laboratory
10. Heptachlor	25	OEPA
11. Heptachlor Epoxide	25	OEPA
12. Hexachlorobenzene	25	OEPA
13. Hexachlorbutadiene	25	OEPA
14. Methoxychlor	25	OEPA
15. Mirex	25	OEPA

The Contractor shall prepare an SOP for collection and distribution of the SWAC samples. The SOP shall provide a matrix table that lists the 100 sampling locations by identifier, the analytes to be determined for each sampling location, the performing laboratory for each analyte, the mass of sample provided for each laboratory at each location to accommodate analytical requirements for that location, and the analytical method to be utilized for each analyte. Subject SOP shall be included in the QAPP Addendum prepared for this work assignment (see Task 2). The Contractor shall provide a map and table showing, respectively, the 100 sampling stations and the x-y coordinates for each station.

A full set of 100 homogenized sediment samples (one for each sampling station) shall be provided by the Contractor to the EPA CLP laboratory with sample size determined by the amount needed to conduct Aroclor (total PCBs) analyses. The Contractor shall provide a subset of 25 random-generated homogenized sediment samples to the OEPA laboratory, all of the same size (see matrix) as all OEPA-designated analyses will be performed on each of the 25 samples. The Contractor shall retain 100 homogenized sediment samples of appropriate size (see matrix) to conduct the analyses assigned to its laboratory. The Contractor shall properly containerize, refrigerate, and ship to the appropriate laboratory the designated sample subset for that laboratory.

The Contractor shall conduct TOC (No. 2 above) and PSD (No. 3 above) analyses on its full set of 100 samples using methods approved in QAPP QAID 163-Q16-0. The Contractor shall conduct the suite of eight radionuclide analyses listed above (Nos. 4 - 11) on its random-generated subset of 25 samples using methods to be specified in the Addendum to QAPP QAID 163-Q16-0 to be prepared by the Contractor (see Task 2). EPA Method 6010B will be utilized by OEPA for all the metals (Nos. 13-18 and 20-25 above) except mercury. EPA Method 7470A will be employed by OEPA for mercury (No. 19 above). OEPA will use OEPA Method 590.1 (based on EPA Method 8270) for the pesticides (Nos. 26-45 above). OEPA will also utilize a method based EPA Method 8270 to carry out PAH analyses. The EPA CLP laboratory (TBD) will be requested to provide the Contractor with the method identifier it will utilize to conduct the PCB Aroclor analysis (No.1 above) assigned to it.

Within 2 months following completion of sample collection and distribution, all SWAC surface sediment sample analyses within the control of the Contractor shall be completed and the results forwarded to the ORD QA contractor that designed the SWAC sampling plan (completion anticipated to be by October 31, 2011).

Task 8. Deployment of Semi-permeable Membrane Device (SPMD) Samplers and Collection of Surface Sediment and Water Column Samples

Passive surrogate samplers in the form of semi-permeable membrane devices (SPMDs) and solid phase micro-extraction (SPME) systems were deployed in the Ashtabula River both during the pre-dredging characterization phase (Phase 1) of the project in 2006 and again immediately after dredging (Phase 3) in 2008. In this work assignment, SPMDs will again be deployed to provide comparative data 4 years after the completion of dredging. SPMEs will not be deployed during this sampling event.

In both 2006 and 2008, SPMD racks were deployed on the sediment surface at 25 locations spanning almost the entire dredge footprint from south of the Upper Turning Basin to the River Bend area. At 10 of these locations, SPMD cages were also deployed by suspending them in the water column. A map and coordinates for these locations were provided in two previous QAPPs for this project (QAID No. 163-Q14 for Phase 1 and QAID No. 163-Q16-0 for Phases 2 and 3).

For this work assignment, the Contractor shall deploy both SPMD racks on the sediment surface and SPMD cages in the water column, but only at the 10 locations where SPMD cages were previously deployed for Phases 1 and 3. The same coordinates used previously shall be used again to site the SPMDs. All SPMD samplers shall be deployed on or about July 30 - August 1, 2011 immediately following the collection of the SWAC surface sediment samples in Task 6.

At two of the ten sampling stations, the Contractor shall deploy duplicate SPMD racks and duplicate SPMD cages. A total of 12 racks and 12 cages will, therefore, be required to complete this task. These 12 SPMD racks and 12 SPMD cages will be exposed to the Ashtabula River environment for 28 days before they are retrieved. The Contractor shall provide from stored inventory (from previous projects with ORD) or fabricate, as needed, the requisite number of racks and cages. All SPMD materials, including standard SPMD ribbons, canisters for holding the water column SPMDs intact, trip blank SPMDs, and reference compound spikes, shall be purchased or rented from Environmental Sampling Technologies (EST), St. Joseph, MO.

Concurrent with deployment of the SPMD racks and cages, the Contractor shall collect surface sediment samples at each of the 10 deployment sites. Similar to the technique utilized to collect SWAC surface sediment samples in Task 6, the Contractor shall employ core samplers to collect the SPMD surface sediment samples. At each location, duplicate grab core samples of approximately 12 in. depth shall be collected. The top 6 in. of each of these two samples shall be retained, composited, and containerized for each location. The remainder of each sample core shall be discarded. Preparing duplicate samples in this manner will yield 10 surface sediment composite samples for analysis, one for each SPMD sampling site.

The Contractor shall also collect water column grab samples at each of the 10 SPMD deployment sites concurrent with the collection of the surface sediment samples. The water samples shall be collected at the approximate mid-depth of the water column.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with SPMD deployment and collection of surface sediment and water column samples and other tasks as needed.

Task 9. Retrieval of SPMD Samplers

The Contractor shall retrieve the 12 SPMD racks and the 12 SPMD cages deployed in Task 8 above on a schedule that provides for an exact 28-day exposure of each sampler, i.e., on or about August 27 -29, 2011. Upon retrieval, all SPMD ribbons shall be removed from sediment racks and the water column cages, properly packaged and iced, and sent to EST for dialysis and extraction. The extracts will be returned to the Contractor for clean-up and analysis.

No surface sediment or water column samples shall be collected during SPMD retrieval.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with SPMD retrieval and other tasks as needed.

Task 10. Conduct of SPMD Analyses

The Contractor shall conduct the following suite of analyses on each of the 24 SPMD extracts returned to the Contractor by EST in Task 9 above using methods approved in QAPP QAID No. 163-Q16-0.

- | | |
|------------------------------------|-----------------------------------|
| 1. PCB Individual Congeners | 4. PCB Aroclors (20% of samples = |
| 2. PCB Homologs | 2 sediment SPMDs and |
| 3. Performance Reference Compounds | 2 water column SPMDs) |

All SPMD analyses shall be completed within 2 months following return of the SPMD extracts from EST to the Contractor (completion anticipated to be by November 30, 2011).

All SPMD samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task 11. Conduct of Surface Sediment and Water Column Analyses for SPMD Study

The Contractor shall conduct the following suite of analyses on each of the 10 surface sediment samples generated during deployment the SPMD racks and cages in Task 8 above using methods approved in QAPP QAID 163-Q16-0:

- | | |
|--|---------------------|
| 1. PCB Individual Congeners | 4. TOC |
| 2. PCB Homologs | 5. Moisture Content |
| 3. PCB Aroclors (20% of samples = 2 samples) | 6. PSD |

The Contractor shall conduct the following suite of analyses on each of the 10 water column samples generated during deployment of the SPMD racks and cages in Task 8 above using methods approved in QAPP QAID 163-Q16-0.

- | | |
|--|--------|
| 1. PCB Individual Congeners | 4. TOC |
| 2. PCB Homologs | 5. TSS |
| 3. PCB Aroclors (20% of samples = 2 samples) | |

All SPMD surface sediment sample and water column analyses shall be completed within 2 months following completion of sample collection the above-described compositing of samples taken during deployment and retrieval (completion anticipated to be by October 31, 2011).

All SPMD surface sediment and water column samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task 12. Deployment of Hester-Dendy (H-D) Sampling Cages and Collection of Surface Sediment Samples

ORD desires to implement a 4-year post-dredging deployment and 4-week exposure of Hester-Dendy (H-D) cages on the Ashtabula River. Accordingly, the Contractor shall deploy H-Ds at the same four locations previously used for deployment in the Ashtabula River for pre-dredging characterization in 2006 and immediate post-dredging characterization in 2008 and the single reference location previously used during those times for deployment in the Conneaut River.

Duplicate body burden (BB) H-D cages equipped with standard 3-in. x 3-in. substrate plates shall be suspended in the water column at each of the five locations. Duplicate BB H-D cages equipped with experimental 5-in. x 5-in. substrate plates shall also be deployed in like fashion at two of the Ashtabula River locations (TBD by the Contractor), yielding a total of 14 BB H-D cages deployed. In addition, at each of the five locations, the Contractor shall deploy an ECO H-D cinder block sampler at the same time the BB H-D samplers are deployed. The ECO H-D samplers shall be left in the river for a 6-week exposure. All H-D samplers shall be deployed on or about August 2 - 3, 2011 immediately following deployment of the SPMDs in Task 8.

All 14 BB H-D cages and assembled H-D substrate clusters will be provided to the Contractor by ORD. The Contractor shall be responsible for attaching the H-D clusters (20 per cage) to the inside of each cage prior to deployment. ORD and/or OEPA will provide the five ECO H-D samplers. The BB H-D samplers shall be suspended in the water column. The ECO cinder blocks shall be laid on their sides on the sediment surface with the H-Ds positioned on the upper sides of the cinder blocks.

Following deployment, the Contractor's responsibilities relative to the ECO H-Ds shall end, i.e., the Contractor will not be responsible for retrieving the ECO H-Ds or analyzing macroinvertebrate growth derived therefrom.

Concurrent with deployment of the H-D cages, the Contractor shall collect surface sediment samples at each of the five deployment sites. Similar to the technique utilized to collect SWAC surface sediment samples in Task 6, the Contractor shall employ core samplers to collect the H-D surface sediment samples. At each location, duplicate grab core samples of approximately 12 in. depth shall be collected. The top 6 in. of each of these two samples shall be retained, composited, and containerized for each location. The remainder of each sample core shall be discarded. Preparing duplicate samples in this manner will yield five composite samples, one for each sampling site. These five samples shall then be refrigerated and stored for later compositing with surface sediment samples collected during H-D retrieval.

No water column samples shall be taken in conjunction with H-D deployment.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with H-D deployment and collection of surface sediment and other tasks as needed.

Task 13. Retrieval of H-D Sampling Cages and Collection of Surface Sediment

The Contractor shall retrieve the 14 BB H-D samplers deployed in Task 12 above on a schedule that provides for an exact 28-day exposure of each sampler, i.e., on or about August 30 - 31, 2011. OEPA will retrieve the five ECO H-D samplers after a 42-day exposure on or about September 13-14, 2011. OEPA will take custody of the ECO samplers at that time and conduct its own set of analyses on the macroinvertebrate growth harvested from the samplers.

Following retrieval of the BB H-Ds, ORD personnel will harvest the macroinvertebrate growth from the H-D substrate plates on site. ORD will freeze and turn the macroinvertebrate samples over to the Contractor. The Contractor shall be responsible for chain-of-custody logging and shipping the macroinvertebrate samples to the designated analytical laboratory.

Concurrent with retrieval of the BB H-D cages, the Contractor shall again collect duplicate surface sediment samples at each of the five deployment sites. Using the same collection techniques employed to collect surface sediment samples during H-D deployment in Task 12, the Contractor shall composite duplicate 6-in. core samples taken at each of the five sampling sites. The Contractor shall then combine each of the five composite samples generated during retrieval with the appropriate stored composite produced during deployment, yielding five new composites, one for each sampling site. These five composites samples shall be shipped to the Contractor's designated laboratory for analysis.

No water column samples shall be taken in conjunction with BB H-D retrieval.

One highly-trained U.S. EPA/NRMRL staff member will be made available to assist with H-D retrieval and other tasks as needed.

Task 14. Conduct of Macroinvertebrate Analyses

The Contractor shall conduct the following suite of analyses on each of the 14 BB macroinvertebrate samples harvested in Task 13 above using methods approved in QAPP QAID No. 163-Q16-0.

- | | |
|--|--------------------------------------|
| 4. PCB Individual Congeners | 4. PAHs (16 priority plus alkylated) |
| 5. PCB Homologs | 5. Wet Weight |
| 6. PCB Aroclors (20% of samples = 2
3-in. x 3-in. H-Ds and 1 5-in. x 5-in. H-D) | 6. Lipids |

All macroinvertebrate analyses shall be completed within 2 months following harvesting of the macroinvertebrates by ORD and the turning of those samples over to the Contractor (completion anticipated to be by November 30, 2011).

All macroinvertebrate samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task 15. Conduct of Surface Sediment Analyses for H-D Study

The Contractor shall conduct the following suite of analyses on each of the five composite surface sediment samples generated during deployment and retrieval of BB H-Ds in Tasks 12 and 13 above using methods approved in QAPP QAID 163-Q16-0:

- | | |
|---|---------------------|
| 1. PCB Individual Congeners | 5. TOC |
| 2. PCB Homologs | 6. Moisture Content |
| 3. PCB Aroclors (20% of samples = 1 sample) | 7. PSD |
| 4. PAHs (16 priority plus alkylated) | |

All BB H-D surface sediment sample analyses shall be completed within 2 months following completion of the above-described compositing of samples taken during deployment and retrieval (completion anticipated to be by November 30, 2011).

All BB H-D surface sediment samples shall be held in archive status by the Contractor until all data are reviewed and accepted by ORD/GLNPO. As directed by ORD, archived samples shall then either be shipped to U.S. EPA-Cincinnati or disposed of properly.

Task 16. Preparation of Monthly Progress Reports

Brief monthly progress reports shall be submitted to ORD/GLNPO by the 20th of the month following the first full month after the Notice to Proceed. These reports shall summarize technical progress and any problems encountered, resolution of said problems, the latest data results, and cost expenditures.

Task 17. Preparation of Final Report

The Contractor shall prepare a comprehensive, interpretive report that incorporates all new research data (as opposed to SWAC data developed for site delisting consideration) generated on this work assignment plus summarizes critical data included in: 1) the previous first-stage final report comparing immediate post-dredging sediment residuals with pre-dredging sediment inventory and concentrations (EPA/600/R-10/126, September 2010), and 2) the second-stage report currently under preparation that is considering all biological (fish and macroinvertebrates) and passive surrogate sampler data generated to date and sediment resuspension data gathered during dredging.

Whereas the second-stage report is focusing on comparison of before dredging, during dredging (where collected), and immediate post-dredging data for each matrix species individually to develop single or standalone lines-of-evidence (one matrix per chapter), this report shall extend interpretation of results between matrix species to link lines-of-evidence to develop a weight-of-evidence approach. The report shall also consider bathymetric data that will be generated independently by the U.S. Army Corps of Engineers under separate funding during the summer 2011 SWAC and research sampling programs. Fish tissue concentration data produced by USFWS for brown bullheads during 2011 shall also be incorporated and evaluated in this report.

The results on SWAC samples analyzed by the Contractor will not be incorporated in this report, but rather shall be forwarded to the ORD QA contractor that designed the SWAC sampling grid. This contractor will be charged to develop a separate interpretive report on all SWAC data generated by OEPA, the CLP laboratory, and the Contractor. The Contractor's contribution to this data pool will be the results of TOC and PSD analyses performed on 100 samples each and a set of eight radionuclide analyses performed on 25 samples (see table on pages 10 and 11).

Assuming all analytical requirements are completed by November 30, 2011, the draft report shall be submitted to ORDGLNPO for review by January 31, 2012. ORD/GLNPO will review the draft report, request changes as needed, and return the draft report to the Contractor for corrections by February 29, 2012. The Contractor shall submit the corrected 508-compliant final report to ORD and GLNPO by March 31, 2012 for final review and approval.

CBI APPLICABILITY

CBI does not apply.

APPLICABLE CONTRACT TASKS

This work assignment titled **"Joint U.S. EPA ORD/GLNPO Project for Evaluation of Remedy Effectiveness and Development of Site Delisting Lines-of-Evidence for the Ashtabula River Environmental Dredging Project"** relates to Task 1 (Collection and Analysis of Data) and Task 3 (Physical Testing) of the current SOW for this contract.

PERFORMANCE MEASURES

The Contractor's performance will be judged by: 1) timeliness in meeting the various completion dates of the 13 field and analytical tasks (Tasks 3 through 15) described above and the completion date (January 31, 2012) of the draft final report cited above, and 2) accuracy and thoroughness in satisfactorily addressing and conducting all elements of this Statement-of-Work as described in the Contractor's Technical Work Plan and the QAPP Addendum to be prepared for this project.

The Government will review the Contractor's promptness in meeting the specified completion dates for the above three areas of the QAPP Addendum, field, and analytical tasks and the draft final data report date. If the Contractor is late by more than 7 days in meeting any of the field and analytical completion dates, a (b)(4) reduction in fee will be applied by the Government. If the Contractor is late by more than 7 days in meeting the completion date for the draft final data report, a (b)(4) reduction in fee will be applied by the Government. If the Contractor is late by more than 7 days in meeting any of the field and analytical completion dates plus the draft final data report completion date, a (b)(4) reduction in fee will be applied by the Government. The reduction in fee will also increase to (b)(4) if the Contractor is more than 14 days late in meeting any of the above completion dates. The reduction in fee will increase to (b)(4) if the Contractor is more than 30 days late in meeting any of the above completion dates. Subject reductions in fee will not apply if it is determined that delayed completion is due to the Government for any reason. Said reductions also will not apply if delayed completion is due to unavoidable adverse weather conditions.

The Government will also review the Contractor's accuracy and thoroughness in addressing and carrying out the technical requirements of their Work Plan and the quality assurance requirements of QAPP Addendum. The Government acknowledges that assessment of accuracy and thoroughness can be subjective and will consult with the Contractor prior to making any final determinations. After due deliberations, if the Government determines that the Contractor has not satisfactorily addressed one or more technical elements or quality assurance requirements, a (b)(4) reduction in fee will be applied to each element and/or requirement. As above, subject reductions in fee will not apply if, for any reason, Government actions have resulted in non-acceptable performance.

If reductions in fee are deemed appropriate, they will apply to both paid and unpaid fees.

PERIOD OF PERFORMANCE

This work assignment is projected to begin on June 23, 2011 and will extend through June 22, 2012.

LEVEL OF EFFORT

This Work Assignment is estimated to require 3,293 professional hours to complete all tasks.

U.S. EPA ORD CONTACTS**1. Work Assignment Manager**

Richard C. Brenner
Environmental Engineer
Soils and Sediments Branch
Land Remediation and Pollution Control Division
National Risk Management Research Laboratory, MS 190
Cincinnati, OH 45268
Office Phone: 513/569-7657
Cell Phone: 513/310-2999
Fax: 513/569-7620
e-mail: brenner.richard@epa.gov

2. Alternate Work Assignment Manager

Marc Mills
Environmental Engineer
Soils and Sediments Branch
Land Remediation and Pollution Control Division
National Risk Management Research Laboratory, MS 190
Cincinnati, OH 45268
Office Phone: 513/569-7322
Cell Phone: 513/633-8487
Fax: 513/569-7620
e-mail: mills.marc@epa.gov

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-13

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2011 To 06/22/2012

Base Option Period Number 2

Title of Work Assignment/SF Site Name

Ashtabula River Dredging Eval.

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Tasks 1 and 3

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 06/23/2011 To 06/22/2012

Comments:

This action approves the contractor's work plan dated 04/16/2012.

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

06/23/2011 To 06/22/2012

Cost/Fee: \$483,055.00

LOE:

This Action:

\$0.00

Total:

\$483,055.00

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

04/19/2012

Cost/Fee: \$204,937.00

LOE: 1,315

Cumulative Approved:

Cost/Fee: \$835,045.00

LOE: 5,340

Work Assignment Manager Name Richard Brenner

Branch/Mail Code:

Phone Number 513-569-7657

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-14

☐ Other ☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2009 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Stat Support for CWA Regs

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☐

Work Assignment Amendment

☐

Incremental Funding

☒

Work Plan Approval

Period of Performance

From 01/05/2012 To 06/22/2012

Comments:

☐ Superfund

Accounting and Appropriations Data

☒ Non-SuperfundSFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee: \$0.00

LOE:

06/23/2009 To 06/22/2012

This Action:

\$68,601.00

Total:

\$68,601.00

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

01/20/2012

Cost/Fee:

\$44,374.00

LOE: 300

Cumulative Approved:

Cost/Fee:

\$44,374.00

LOE: 44,374

Work Assignment Manager Name Marla Smith

Branch/Mail Code:

Phone Number 202-566-1047

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-14

☐ Other☐ Amendment Number:

Contract Number

EP-W-09-024

Contract Period 06/23/2009 To 06/22/2012

Base

Option Period Number 2

Title of Work Assignment/SF Site Name

Stat Support for 316b

Contractor

BATTELLE MEMORIAL INSTITUTE

Specify Section and paragraph of Contract SOW

Task II Data Analysis

Purpose:



Work Assignment



Work Assignment Close-Out



Work Assignment Amendment



Incremental Funding



Work Plan Approval

Period of Performance

From 01/05/2012 To 06/22/2012

Comments:

Work Assignment Initiation - A Technical and Financial Work Plan is required. Estimated LOE is 300 hours.



Superfund

Accounting and Appropriations Data



Non-Superfund

SFO
(Max 2)

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee:

LOE:

06/23/2009 To 06/22/2012

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name Marla Smith

Branch/Mail Code:

Phone Number 202-566-1047

FAX Number:

(Signature)

(Date)

Project Officer Name Cynthia Bowie

Branch/Mail Code:

Phone Number: 202-564-7726

FAX Number:

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Christine Edwards

Branch/Mail Code:

Phone Number: 202-564-2182

FAX Number:

(Signature)

(Date)

Contract No. EP-W-09-024
Work Assignment 2-14

TITLE: Statistical Support for Clean Water Act §316(b) Regulations

Purpose:

This work assignment is a continuation of work started under Contract Number EP-C-05-030, Work Assignments 2-13 and 3-13. This work assignment does not duplicate any work in the previous work assignments.

Under Work Assignment 3-13 in contract EP-C-05-030, the contractor provided statistical support to EPA's evaluations of the impingement and entrainment data that were used in developing the proposed rule under Section 316(b) of the Clean Water Act. EPA has since received comments on the data and statistical aspects of the proposed rule.

This new work assignment relates to Task II Data Analysis of the current Statement of Work (SOW) of the contract. In particular, the work assignment will provide statistical support to EPA's evaluation and revisions for the final rule. The contractor shall provide support in areas including statistical documentation, statistical analysis of performance data, statistical review and comment, and statistical documentation for the development of the final regulations for cooling intake structures.

I. BACKGROUND

The Clean Water Act, Section 316(b) requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. More than 1,500 industrial facilities use large volumes of cooling water from lakes, rivers, estuaries or oceans to cool their plants, including steam electric power plants, pulp and paper makers, chemical manufacturers, petroleum refiners, and manufacturers of primary metals like iron and steel and aluminum. The Phase II rule, for existing power generators that withdraw at least 50 million gallons per day of cooling water, was promulgated on July 9, 2004. In 2007, a decision issued by the U.S. Court of Appeals for the Second Circuit (*Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d Cir. 2007)), precluded EPA from applying the Phase II rule. In response, on July 9, 2007, EPA announced in a Federal Register Notice (72 FRN 37107) that it was suspending the requirements for cooling water intake structures at Phase II existing facilities, pending further rulemaking.

In March 2011, EPA proposed flexible technology standards that would greatly reduce damage to ecosystems while accommodating site-specific circumstances and providing cost effective options. The proposed rule covers roughly 1,260 existing facilities that each withdraws at least 2 million gallons per day of cooling water. EPA estimates that approximately 590 of these facilities are manufacturers, and the other 670 are power plants. The technologies required under the rule have been in use for several decades and have been implemented at a large number of facilities. More information about the proposed rule is available at <http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/index.cfm>.

EPA intends to issue a Notice of Data Availability in the next few months with the final rule issued in July 2012.

II. SCOPE OF WORK

Task 1: Workplan and Cost Estimate

The contractor will provide a work plan that describes the support that will be provided; identifies deliverables; and identifies potential problems that may arise in completing this work assignment on schedule and within budget.

The contractor shall provide overall work assignment management and interface with the EPA WAM.

TASK 1 – DELIVERABLES	
Deliverable	Due Date
Work plan	• Due 15 calendar days following receipt of Work Assignment.
Interface with EPA WAM	• As needed

Task 2: Quality Assurance

Quality Assurance Project Plans are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1A2 and implementing guidance CIO-2105-P-01-0. All projects that involve the generation, collection, analysis and use of environmental data must have an approved QAPP prior to the commencement of the work.

QA Project Plan Requirements

EPA policy requires that an *approved* Quality Assurance Project Plan (QAPP) be in place before any work begins that involves the collection, generation, evaluation, analysis or use of environmental data. This work assignment is a continuation of work previously performed by the contractor under Contract EP-C-05-030 and a QAPP was prepared under WA 2-13 to support work performed to support this project. The contractor shall use this version as a starting place for a QAPP for this new WA. It is anticipated that few revisions will be required.

The Contractor shall review the previous QAPP to verify that the QAPP adequately documents how quality assurance (QA) and quality control (QC) shall be applied to all activities to be performed under this work assignment. As part of this review, the Contractor shall also verify that existing QAPP content (e.g., organizational charts, roles and responsibilities, QA/QC procedures, checklists, SOPs, etc.) are still appropriate for the work to be performed under this work assignment. In addition, the contractor shall verify that the QAPPs:

- Addresses all activities identified in this PWS that involve the **generation** (including field studies, laboratory studies, and modeling output), **collection** (including surveys, literature searches, and third party data), **evaluation** (including data inspection, review, assessment, and validation), **analysis** (including statistical, engineering, and economic

analysis and testing, evaluation, and validation of methods and models) **and use of data** to support EPA decisions, regulations, policy, publications or tools (including effluent guidelines, methods, criteria, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs). Examples of data include, but are not limited to, wastewater sample analysis results, flow measurements or data, facility questionnaire data, economic data, use of models, secondary data (including sources and the acceptance criteria), any software and database management requirements and any other relevant work that might affect the quality of the data. Note that QAPPs are also required for the development or revision of models and software that support the generation, collection, evaluation, analysis or use of data. For example, when existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model, how it shall be used, and how the model output shall be evaluated to ensure it meets the overall quality objectives for the project. However, development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that shall be applied to the model, and the procedures for evaluating whether the model meets those criteria.

- Provides enough detail to clearly describe objectives of the project supported by the work assignment; the type of data to be collected, generated, or used under this work assignment to support the project objectives; the quality objectives needed to ensure that these shall support the project objectives; and the quality assurance and quality control activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.
- Includes specific performance criteria and measures that shall be used to verify that data generated, collected or used in this work assignment meet those criteria. If a database or other electronic tool (e.g., model, spreadsheet, etc.) shall be created for the project, the QAPP must describe how the database or electronic tool shall be documented (e.g., data element dictionary, user manual, SOP, or other means appropriate for the project), the controls to ensure accurate data entry (when data from another source are manually entered into the database), data transfer (when data are transferred from one electronic medium to another), or data merging (when data from multiple databases or electronic media are merged into a single database).
- Explicitly references tools, such as SOPs, checklists, and guidelines that the contractor shall use in the project to document data quality. The QAPP must include the tools as attachments for EPA's review and acceptance.
- Addresses the following general questions:
 - What is the objective/goal of this effort?
 - What are the roles and responsibilities of staff who shall support this project, and how to they relate to the specific key steps
 - What training and competency requirements are necessary for key personnel that shall support the project?
 - If models shall be used to support the project, what are these models, why have they been selected, and how shall they be validated, documented, and used?
 - What are the SOPs, tools and checklists that shall be used?

- Under no circumstances shall work that involves the generation, collection, evaluation, analysis, or use of environmental data be performed without an approved QAPP (or addendum) in place 50 work days after submission of the Contractor's work plan.
- Under no circumstances shall field sampling or laboratory analysis activities be conducted prior to receipt of an approved work plan.
- Any non-sampling/non-analytical work that involves the generation, collection, evaluation, analysis, or use of environmental data that is initiated prior to approval of the Contractor's QAPP must be performed in accordance with the approved QAPP. (The QAPP requirements must be applied retroactively to this period that lasts no more than 50 work days from submission of the Contractor's work plan.).

Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis that the information is capable of being substantially reproduced. To support compliance with these data transparency/data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public.

Information contained in the approved QAPP must be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the Contractors should indicate which results were obtained using the tools (SOPs, checklists, and guidelines) that the Contractor designates as confidential so that the EPA WAM can easily identify the areas that shall require rigorous robustness checks and document that those checks have been performed.

Additional QA Documentation Required

In addition to the QAPP requirements described above, all major deliverables (e.g., Technical Support Documents, Study Reports, Study Plans, etc.) produced by the Contractor under this work assignments must include a discussion of the QA/QC activities that were or shall be performed to support the deliverable. For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies that were employed to control and document the quality of data generated and used.

The contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this work assignment. These monthly QA reports shall identify QA activities performed to support implementation of this work assignment, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the contractor may include this as a part of the contract-required monthly financial/technical progress report.